JUN 11 1938

OCTOBER 20, 1937 NUMBER 323

THE UNIVERSITY OF NORTH CAROLINA RECORD

RESEARCH IN PROGRESS

OCTOBER, 1936—OCTOBER, 1937

GRADUATE SCHOOL SERIES No. 32

THE UNIVERSITY OF NORTH CAROLINA PRESS
ISSUED 12 TIMES A YEAR AS FOLLOWS: 4 NUMBERS IN FEBRUARY, 3 NUMBERS IN MARCH, 3 NUMBERS IN APRIL, 1 NUMBER EACH IN JUNE AND OCTOBER
ENTERED AS SECOND-CLASS MATTER AT THE POSTOFFICE AT
CHAPEL HILL, N. C.
UNDER THE ACT OF AUGUST 24, 1912

OCTOBER 20, 1937 NUMBER 323

THE UNIVERSITY OF NORTH CAROLINA RECORD

RESEARCH IN PROGRESS

OCTOBER, 1936—OCTOBER, 1937

GRADUATE SCHOOL SERIES No. 32

THE UNIVERSITY OF NORTH CAROLINA PRESS
CHAPEL HILL, N. C.

FOREWORD

The present issue of Research in Progress is the seventeenth volume of this publication. It contains, in the longest part, the record and summary analysis of the investigations accomplished and published and of those in process of completion by graduate students and faculty of the University of North Carolina during the year ending October 1, 1937.

In the first part, a report of grants from the Smith Research Fund is made. This fund, made available in 1924, is the income from the bequest of Robert K. Smith, and is administered by the Administrative Board of the Graduate School in aid of research. In Part III, reports of research organizations and publications are offered. The last part consists of a list of faculty publications without digests. This list contains articles of a popular nature and text-books.

W. W. Pierson, *Dean*

Library, Univ. of
North Carolina

TABLE OF CONTENTS

Page

PART I. Report of the Smith Fund 4

PART II. Report of Research by Departments 7

PART III. Research Organizations and Publications 134

A. Organizations—

1. The Institute for Research in Social Science 134
2. The Elisha Mitchell Scientific Society 140
3. Philological Club 148
4. The Society of the Sigma Xi 151

B. Publications—

1. The Journal of the Elisha Mitchell Scientific Society 152
2. Studies in Philology 153
3. North Carolina Law Review 154
4. Social Forces 154
5. University News Letter 156
6. The Southern Economic Journal 157
7. The Carolina Play-Book 157
8. South Atlantic Bulletin 158

PART IV. Faculty Publications without Digests 160

INDEX 167

246333

Part I

APPROPRIATIONS GRANTED FROM THE SMITH RESEARCH FUND

PROJECT NO.	APPLICANT	SUBJECT	AMOUNT
303	U. T. Holmes	For subvention of printing costs of bulletin "A Census of the French and Provençal Dialect Dictionaries in America"	$ 27.00
304	Comer Vann Woodward	For travel expenses to Washington, to examine materials in Library of Congress with reference to his doctoral dissertation	25.00
305	J. Penrose Harland	For purchase of two books	9.00
306	Francis C. Hayes	For materials to complete the work on Spanish Historical Dictionary project	35.00
307	J. M. Valentine	For six copper plates for use in connection with publication of research article	26.20
308	A. E. Zucker	To acquire photostats of three German documents in archives of Moravian Church	15.00
309	E. W. McChesney	To defray cost of micro-analyses of organic compounds, to be used in research paper on identification of the amino acids	20.00
310	W. F. Prouty	To aid in the study of the identity of the so-called Carolina Bays	125.00
311	H. W. Straley	For completion of a Geometric Map of Giles County, Va.	50.00
312	S. E. Leavitt	For purchase of books in aid of a survey and bibliography of Hispano-American Literature for the year 1936	50.00
313	R. W. Linker	For photostats of medical works of Trotula	10.00
314	J. Penrose Harland	For the purchase of two books essential to his research	15.50
315	James E. Hicks	For assistance in travel expenses to Washington to examine the writings of Alexander Del Mar in the Library of Congress	11.40
316	Clarence Kuhlman	For travel expenses to Washington to confer with members of the staff of the Federal Power Commission in connection with research on doctoral dissertation	20.00
317	A. R. Newsome	For photostats of letters in the General Joseph G. Swift Papers in the U. S. Military Academy, West Point	12.00
318	L. O. Katsoff	For assistance in travel expenses to Paris for consultation with certain men in connection with preparation of a book on "Philosophy of Mathematics."	100.00
319	Richmond Bond	For assistance in travel expenses to various libraries in connection with his research on Joseph Addison and the early periodicals	50.00
320	A. D. Beach Langston	For assistance in travel expenses to England to examine certain books in British libraries in connection with doctoral dissertation	100.00
321	T. F. Hickerson	For purchase of material to be used in studies with the Beggs Deformeter Apparatus	10.00

APPROPRIATIONS GRANTED FROM THE SMITH RESEARCH FUND

(Continued)

PROJECT NO.	APPLICANT	SUBJECT	AMOUNT
322	W. S. Jenkins	For assistance in his study of the amending processes of the Constitution: for travel, $75.00; for photostats, $40.00; for typing manuscripts, $35.00	$150.00
323	J. C. Russell	For assistance in preparation of an article for a learned journal	20.00
324	J. N. Couch	For assistance in the study of the cytology of the lower fungi	75.00
325	Lane Barksdale	For assistance in collecting plants belonging to the genus *Trillium*	20.00
326	John E. Craps	For assistance in travel expenses to Vienna for work on doctoral dissertation	100.00
327	K. C. Frazer	To complete compilation of source material for his biography of Senator John Tyler Morgan	75.00
328	T. F. Hickerson	To purchase a book needed for his research	15.00
329	Department of Philosophy	To purchase three books needed by a graduate student in the department	20.00
330	W. W. Pierson	To purchase a set of books (12 to 16 volumes), dealing with the history of Cuba	50.00
331	Department of Zoology	To purchase a file of a foreign periodical	91.43
332	Department of Geology	To purchase certain books needed by the faculty of the department	46.50
333	Department of Mathematics	To purchase certain books needed by the faculty of the department	75.00
334	W. W. Pierson	For clerical services and other expenses in connection with the central research committee	35.00
335	Nita Pyburn	For aid in travel expenses to Raleigh and Richmond to examine newspaper files in connection with her doctoral dissertation	25.00
336	J. C. Russell	To pay for graphs and tabulations to illustrate a research article	18.00
337	Karl C. Pfeiffer	For assistance in travel expenses to Italy to study the unpublished letters of Walter Savage Landor	100.00
338	Harold D. Meyer	To secure photographs of the Youth Movements in Europe	50.00
339	Albert Irving Suskin	For assistance in preparation of a paper to be published in a learned journal	15.00
340	Robert W. Linker	For securing photostats of a manuscript in the Bibliotheque Nationale	50.00
341	W. deB. MacNider	For assistance in travel expenses to Washington and to Philadelphia, and to pay for microphotographs	50.00
342	David K. Spelt	For assistance in travel expenses to Baltimore in connection with his doctoral research	35.00

RESEARCH IN PROGRESS

Part II

REPORT OF RESEARCH BY DEPARTMENTS

DEPARTMENT OF ANATOMY

W. C. George reports the following papers:

The Significance of Blood in the Classification of Animals. Presented before the Elisha Mitchell Scientific Society, March 2, 1937, and the meeting of the Biologists of the Southeastern States, Athens, Georgia, May 7, 1937. (For abstract see p. 144.)

The Formation of New Siphon Openings in the Tunicate, *Styela plicata*. *The Journal of the Elisha Mitchell Scientific Society,* **53:** 87-93. 1936. (For abstract see *Research in Progress,* 1936, p. 6.)

A Comparative Study of the Blood of the Tunicates. (In press.)

This study is based upon a comparison of the blood of twenty-six species of ascidians studied by the author and such observations as have been reported in the literature by others. Certain types of cells appear to be common to all ascidians; others have a limited distribution. The cells that are of general occurrence are hemoblastic cells comparable in appearance to vertebrate large lymphocytes, macrophages, and a variety of vacuolated cells, including the green cell type, containing nutrient materials. Those cells having a limited distribution are orange or other colored cells containing carotinoids, miscellaneous colored cells that probably contain nutrient materials, and vanadium compounds, nephrocytes containing purine bases, colorless morula cells, and glomerulocytes of unknown function.

The various nutritive cells, which are abundant in tunicates, are looked upon as nurse cells to the fixed tissues. Histological evidence shows that they become applied to muscle fibers and other fixed tissues. They give evidence of enzyme activity in the vacuoles. This is associated with a limited secretion of enzymes into the gut lumen. The structure of the gut wall permits the cells to come freely into direct relation with the gut epithelium and the food-rich plasma that bathes it.

The genetic relationships of the blood cells are discussed, and the relation of blood cells to variation in color of zoöids and colonies is considered.

Certain histological features of the blood have a specific distribution and are of taxonomic significance.

W. S. HAMMOND reports the following papers:

The Developmental Transformations of the Aortic Arches in the Calf, with Especial Reference to the Formation of the Arch of the Aorta. (To be published in *The American Journal of Anatomy.*)

The aortic arches in the calf (Bos Taurus) present striking pictures as they undergo progressive changes in establishing the major cranial arteries. Extrinsic factors appear to play the greatest part in this transformation. The formation of the definitive arch of the aorta is discussed, as is the fate of the aortic arches. The so-called fifth aortic arch does not occur in the calf and is considered to be a questionable structure in mammals having but four pouches. A paraganglion artery, arising from the pulmonary trunk, is reported.

A Rare Cardiac Anomaly. (To be published in *The Anatomical Record.*)

A single case report in which the outstanding features were: tricuspid aplasia, enlargement of the right auricle, patent foramen ovale, rudimentary right ventricle, rudimentary pulmonary arteries, and only two leaflets in the pulmonary valve.

FRANK N. LOW has the following research project under way:

A Detailed Study of the Response of the Thymus to Staining with Vital Dyes.

This is a continuation of work done at Tufts College Medical School during the academic year 1936-1937, the results of which are expected to appear during the present year.

JAMES C. WREN has published:

A Case of Retrocaval Ureter. *The Anatomical Record,* **68**: 389-392. 1937.

A case of retrocaval ureter in man is described. It is interpreted as being the result of the embryonic posterior cardinal vein, persisting on the right side and forming the postrenal segment of the adult inferior vena cava.

DEPARTMENT OF BOTANY

W. C. COKER has in proof:

The Monoblepharidales and Blastocladiales, and (with VELMA MATTHEWS) The Saprolegniales.

The above three orders are to make up one number of *North American Flora,* a large series published by the New York Botanical Garden and eventually to describe all species found in North America, including Greenland, Central America, and the West Indies.

W. C. COKER and H. R. TOTTEN are continuing their work on the Shrubs of the Southeastern States. About four hundred drawings have now been made, chiefly by MRS. CECIL JOHNSON and MRS. H. M. BURLAGE. Many species have been described.

W. C. COKER and ALMA HOLLAND are continuing their work on the fungi. Numerous new photographs and paintings to illustrate their monograph of the *Boletaceae* of North Carolina have been made during the year.

H. R. TOTTEN is preparing a List of the Woody Plants of Giles County, Virginia.

J. N. COUCH has published:

Notes on the Genus *Micromyces. Mycologia,* **29**: 592-596, 14 figs. 1937.

PROFESSOR COUCH has in press:

A New Fungus Intermediate between the Rusts and *Septobasidium. Mycologia,* **29**: November-December, 1937.

This fungus parasitizes scale insects but produces brown, thick-walled winter spores as in the rusts. In physiology and structure it represents an unmistakable connection between the rusts and *Septobasidium.*

A Fungus that Catches Nematodes. *The Journal of the Elisha Mitchell Scientific Society,* **53**: 2: 301-309. Pl. 27. 1937.

A fungus, *Dactylella bembicodes,* that catches nematodes is described. The nematode traps consist of a loop of three cells, by the swelling of which the nematodes are caught. It has been found that the traps are formed in artificial culture: (1) when nematodes are present; (2) when the culture medium is acid; and (3) when the food supply in the agar is reduced. By growing the fungus and nematodes in artificial culture it has been possible to have a supply of nematode traps and nematodes for experiments. It has been determined: (1) that closure of the trap is instantaneous, occurring the moment a nematode thrusts its head or tail into a trap; (2) mechanical irritation or chemicals may cause slight closure; (3) heat, as warm water or dry heat between 33° and 75°, causes complete and instantaneous closure. It is assumed that the nematodes give off some chemical which causes the colloids within the loop cells to swell.

PROFESSOR COUCH has ready for publication:

Monograph of *Septobasidium.*

This is to be published in book form and will include an account of the biology of the genus and descriptions of 172 species, ninety of which are the old types while the remainder are new. The book will be illustrated by sixty text-figures and 114 plates.

PROFESSOR COUCH directed the following research:

HELEN BERDAN. Revision of the Genus *Ancylistes.* (Accepted for publication in *Mycologia,* 1938.)

In *Ancylistes closterii* and *A. Pfeifferi* the discovery of conidial formation as in *Conidiobolus* is reported and described for the first time. Sexual reproduction appears to be homothallic, conjugation being lateral or scalariform. On the basis of reproduction by conidia, the chemical nature of the cell wall, and the type of sexual reproduction, the genus *Ancylistes* is removed from the *Ancylistales* to the *Entomophthorales* and tentatively assigned to a position near *Completoria.* This is the first report of *Ancylistes* in North America.

A summary of the above article was published in *The Journal of the Elisha Scientific Society,* **53**: 2: 343-344. 1937.

FRANCES FOUST. A New Species of *Rozella* Parasitic on *Allomyces. The Journal of the Elisha Mitchell Scientific Society,* **53**: 197-204. 1937.

J. E. ADAMS is continuing his taxonomic and anatomical studies of the genus *Arctostaphylos* Adans. His monograph of the genus, begun two years ago, is nearing completion.

Studies on the application and value of histological criteria in species delimitation in certain genera of Seed Plants are progressing.

The following master's theses have been accepted by the Department during the year:

DONALD D. RITCHIE. Morphology of the Perithecium of *Sordaria fimicola* (Rob.) Ces. and DeNot. (Under the direction of J. N. COUCH.) (In press in *The Journal of the Elisha Mitchell Scientific Society,* **53.**)

Sordaria fimicola, a homothallic member of the coprophilous Sphaeriales, has been investigated. The perithecial initial is a coiled, septate, terminal hypha, which becomes invested with vegetative hyphæ. There is no antheridium. The archicarp gives rise to vegetative growth only, the ascogenous hyphae arising from vegetative cells of the perithecium. Paired nuclei fuse

in the primary ascus cell, which proceeds to ascus formation either with or without crozier formation. The fusion nucleus divides three times to form eight nuclei, each of which produces a beak, from the tip of which radiate the astral rays that delimit the spore. The finished spore, by another mitosis, is binucleate.

LELAND SHANOR. Observations on the Development and Cytology of the Sexual Organs of *Thraustotheca clavata* (de Bary) Humph. (Under the direction of W. C. COKER and J. N. COUCH.) (Published in *The Journal of the Elisha Mitchell Scientific Society,* **53:** 119-136. 1937.)

The cytology and development of *Thraustotheca clavata* agree in general with those of other members of the *Saprolegniaceae.* Fertilization is demonstrated. Chromic acid-formalin fixing followed by Gram's stain gave the best results.

In the cleavage of the egg origins, the centrosome and the astral rays are directed outward in all cases. The centrosome occupies a central position in the egg origins and the young oöspores. The astral rays extend to the margins of the young oöspheres and into the cytoplasmic bridges between egg origins. Astral rays are demonstrated for the first time in the young zoöspores.

In view of the position of the centrosome and the length of the astral rays during the formation of oöspheres in *Thraustotheca,* a relationship between the function of the acromatic figure here and of that in the Ascomycetes is advanced.

LAURIE STEWART. Studies in the Life History of *Nitella hyalina* Agardh. (Under the direction of W. C. COKER.) (Published in *The Journal of the Elisha Mitchell Scientific Society,* **53:** 173-190. 1937.)

A study of the cytology of *Nitella hyalina* Agardh. was made almost entirely from whole mounts stained by the Feulgen technic. These observations were checked by the study of living material stained with iron-aceto-carmine, methyl-violet and fuchsin, and congo-red.

Observations of fixed and living material show that in general the antheridial and oögonial development agrees with that described for the other species of *Nitella* and *Chara.*

Chief conclusions reached were that the species is *Nitella hyalina,* and as far as can be determined, is the first definite record of its occurrence in this country; the term "wendungszellen" introduced by Braun, is not applicable to the egg development in this species; the long spiral threads found in the sheath cells are nuclei; the sperm are thought to escape by perforation of the cell walls; reduction division does not occur during gametogenesis.

DEPARTMENT OF BIOLOGICAL CHEMISTRY

JAMES C. ANDREWS has published during the year the following papers based on work done in the Medical School of the University of Pennsylvania:

(With KATHLEEN CRANDALL ANDREWS.) Substances Which Inhibit Color Development in the Sullivan Method for Cystine. *Journal of Biological Chemistry,* **118**: 555. 1937.

(With PERRY D. MELVIN.) Nephrolithissis and Cystine Excretion in Cystinuria. *Journal of Urology,* **37**: 655. 1937.

(With CHARLES B. RUTENBER.) The Applicability of the Benedict-Denis Procedure to the Determination of Methionine Sulfur. *Journal of Biological Chemistry,* **120**: 203. 1937.

He has in progress research on the following subjects:

Reduction of Certain Sulfur Compounds to Hydrogen Sulfide by the Intestinal Microorganisms of the Dog.

The purpose of this investigation is to study the ability of the mixture of microorganisms ordinarily present in the intestinal mucosa of the dog to produce hydrogen sulfide from the following sulfur compounds: l-cystine, dl-cystine, dibenzoyl cystine, cystine hydantoin, cystine phenyl hydantoin, cysteic acid hydantoin, cysteic acid phenyl hydantoin, cysteic acid, taurine, methionine, sodium sulfate, sodium sulfite, sodium thiosulfate and free sulfur. The ability of an animal to oxidize ingested sulfur compounds is usually judged by the urinary excretion of inorganic sulfate. However, the hydrogen sulfide often produced by the action of intestinal microorganisms on sulfur compounds is readily absorbed from the intestine and oxidized to sulfates. Hence urinary production of the latter may be chiefly a final result of bacterial action, rather than of metabolic oxidation. For this reason an investigation of the extent of this action with different sulfur compounds is indicated.

The Hydrolysis of Hair.

Hair and similar keratins, which are readily hydrolyzed by boiling acids into their constituent amino acids, may be hydrolyzed much more slowly at reduced temperatures (room temperature or body temperature). Under these conditions the specific effects of different acids, the catalytic effect of the glass surface and the production of intermediate hydrolysis products can be studied. Under certain conditions a proteose-peptone mixture can be produced which has as high a sulfur content as the original human hair but which is capable of tryptic digestion and utilization by the animal organism.

Studies on Cystinuria. (With Kathleen Crandall Andrews.)

The metabolic abnormality known as cystinuria, which prevents the normal oxidiation of protein sulfur to urinary sulfate, is being further studied. This condition sometimes results in the deposition of the unoxidized cystine as calculi in kidney or urinary bladder, necessitating surgical treatment. The relation between cystine excretion and actual calculus production is being studied, as well as the effect of various related compounds on the cystine output of such subjects. Particular studies have been made of the relation between the intake of ascorbic acid (Vitamine C) and the excretion of cystine. In this connection it has been found that the presence of excessively large quantities of ascorbic acid (Vitamine C) in the urine makes impossible the application of the usual methods for determining cystine. This necessitates further studies of the analytical methods required.

Metabolic Production of Sulfate from Cyclic Sulfonic Acids Related to Cystine and Methionine.

Although cysteic acid is apparently unchanged on passing through the animal organism and produces no urinary sulfate, past experiments have indicated that sulfonic acids of some cyclic derivatives of cystine (hydantoins) are capable of losing part of their sulfur as sulfate under biological conditions. Since some such process may represent the course of sulfur metabolism, various cyclic sulfonic acids related to cystine and methionine are being prepared and studied. In this connection the effect of concentrated sulfuric acid on amino acids is being studied. A preliminary abstract concerning the solubilities of amino acids in concentrated sulfuric acid was published in the *Proceedings* of the American Society of Biological Chemists (1937), p. v.

The general purpose of this research is to attempt to trace the course of sulfur metabolism in the animal body.

G. C. Kyker directed the following research at the University of Richmond last year:

H. E. Wright, Jr. (Master's thesis.) The Reactions of Creatinine with Certain Aliphatic Halogen Compounds.

He is completing his doctoral dissertation, A Study of the Preparation and Properties of Certain Halogenated Cymidines. (Started under the direction of Professor A. S. Wheeler in the Department of Chemistry.)

DEPARTMENT OF CHEMISTRY

EDWARD MACK, JR., has published:

Remarks on Molecular Structure and van der Waals Forces, presented at the Symposium on Molecular Structure, held at Princeton, December 31, 1937, and published in the *Journal of Physical Chemistry,* **41:** 221. 1937.

Review of *Physical Chemistry* by Frank H. MacDougall, *Journal of the American Chemical Society,* **59:** 427. 1937.

Review of *Elementary Physical Chemistry* by Hugh S. Taylor and H. Austin Taylor, *Journal of Physical Chemistry,* **41:** 765. 1937.

PROFESSOR MACK has directed the following research:

N. L. SIMMONS. (Doctoral dissertation.) The Precise Measurement of Gas Viscosities by the Oscillating Disk Method.

The theory of the oscillating disk type of gas viscometer has been investigated experimentally. A very precise instrument made of quartz has been developed as a result of the preliminary investigation. This instrument has been used to measure the viscosities of air, water vapor, and heavy water vapor over the temperature range, 23° C. to 375° C., and of hydrogen and carbon dioxide gases at 23° C. The data obtained for air are found to agree with J. E. Jones's equation relating viscosity and temperature, to better than 0.1% at all points within the temperature range studied. The data for water vapor and heavy water vapor throw some interesting light on the size (collision area) of the heavy water molecule. The two water molecules are found to be probably the same size in the vapor phase. Also, the question of association of water in the vapor phase is believed settled by the finding that viscosity does not change as pressure changes within the temperature range 75° C. to 350° C.

FRANK K. CAMERON is directing investigations looking to utilizing the whole cotton plant as a source of oil and cellulose. MR. DAVID T. MILNE, du Pont Fellow, is investigating control of the factors involved in "pulping" or producing alpha cellulose from the pulverized whole plant after the removal of fats and waxes by solvents (doctoral dissertation); and MR. L. B. CONTE is making a comparative study of certain solvents and the recovery of a merchantable oil from the extracts (master's thesis). During the past year MR. MILNE developed an operating technique which completely removes silica, ferric oxide, and alumina during the preparation of the cellulose pulp.

Cultural procedures for the production of maximum yields of oil and of cellulose and minimum costs are being studied in coöperation with the North Carolina State Experiment Stations at Raleigh, Rocky Mount, and Statesville; with the South Carolina State Experiment Station at Florence; with the Dockery Farms in Richmond County, North Carolina; and with the Coker Plantations near Hartsville, South Carolina. The John Deere Plow Company coöperated with tests and demonstrations of harvesting whole cotton at the Dockery Farms, and "movie" record of these demonstrations, as well as laboratory operations, was made by the Paramount Pictures Corporation. An illustrated lecture describing the studies on whole cotton was given before the Sections of the American Chemical Society at Johnson City and Nashville, Tennessee, and at Atlanta, Georgia.

PROFESSOR CAMERON is directing investigations of the "Fundamental Properties of the Components of Mill Wastes," assisted by Assistant Professor for Industrial Research JAMES E. MAGOFFIN and several Honorary Fellows. The work is supported by a grant from the Textile Foundation for the identification and control of the factors involved in the clarification and purification of the waste waters from textile operations. DR. MAGOFFIN has, by means of migration studies, estimated the character and relative amounts of the electrical charges on particles in colloidal suspensions of platinum, gold, oleic acid and indigo, and the variations induced by hydrogen ion concentration and the presence of sodium chloride. He is continuing these studies assisted by MR. H. T. HATCH (doctoral dissertation). MR. P. H. BURDETT is studying the charges on fine gas bubbles and how these are affected by solutes (doctoral dissertation). MR. B. R. CLANTON is studying the adaptation of "flotation" methods to the removal of colloidal suspensions from water (doctoral dissertation) and has completed a study of the flotation of ferric hydrate. A series of reports on these investigations is to appear in *Textile Research.*

PROFESSOR CAMERON is directing the following investigations:

W. F. BARTZ. (Progress on doctoral dissertation.) The effect of SO_2 on Aqueous Suspensions of Al_2O_3.

F. B. CULP. (Progress on doctoral dissertation.) The system $Fe_2(SO_4)_3$-$CuSO_4$-HO_2.

PROFESSOR CAMERON has presented the following papers:

Before the American Chemical Society, Chapel Hill, April, 1937:

(With J. E. MAGOFFIN.) Migration Velocity Studies on Sodium Oleate and Platinum Sols.

(With W. A. PERRY.) Flotation of Metal Oxides from Aqueous Suspensions.

(With D. T. MILNE.) Removal of Silica in the Pulping of Whole Cotton.

Before the North Carolina Academy of Science, Salisbury, May, 1937:

(With D. T. MILNE.) Utilization of Whole Cotton.

Before the Colloid Symposium, Minneapolis, Minnesota:

(With J. E. MAGOFFIN.) The Solid Phase in Dispersed Systems.

PROFESSOR CAMERON has published the following papers:

(With J. R. TAYLOR.) Utilization of Alunite through Alkali Fusion. *Journal of Industrial and Engineering Chemistry,* **29**: 96. 1937.

(With A. R. MACORMAC.) Pulps from the Whole Cotton Plant. *Journal of Industrial and Engineering Chemistry,* **29**: 96. 1937.

Utilization of Whole Cotton. *The Cotton Trade Journal,* **17**: 112. 1937.

Cellulose from Cotton. *Manufacturer's Record,* CVI: 7. 1937.

PROFESSOR CAMERON directed the following research:

WILLIAM ALVA PERRY. Flotation of Metal Oxides from Aqueous Suspensions. (For the master's degree.)

Bubblers were made of sheet platinum drilled with holes 0.004 inch in diameter. They were placed in cylinders of about one liter capacity. The pumping system gave a steady source of compressed air. A steady stream of bubbles of uniform size was obtained.

Samples of hydrous oxides were prepared by careful precipitation and electrolytes removed by decantation. They were peptized in aqueous suspensions. Investigations on the "floatability" of hydrous oxides of silicon, iron, and aluminum were made. Forty-one different agents have been tried. These reagents were added in successive small quantities until all possible action had taken place.

Two types of flotation were recognized: (a) Adsorption of the suspensions by the agent added, the resulting particle being lighter than water and consequently rising to the surface. Rosin and abietic acid belong to this class. (b) Adsorption of the floating agent by the material to be floated. Air adhering to these agglomerates brings them to the surface. Gardinol, sodium oleate, and other soaps belong to this class.

Since the latter type of flotation is due to the adsorption of the floating agent by the material to be floated, flotation can be cut down if adsorption can be lessened. It is known that hydrogen and hydroxyl ions are strongly adsorbed by alumina. The addition of these in high concentration, therefore, should inhibit flotation with gardinol and sodium oleate. This was found to be true. It is also seen that unless the pH is kept within a more or less defined range of values, excessive amounts of the reagents are required to remove alumina from suspension.

JAMES T. DOBBINS has directed the following research:

(With EDWIN C. MARKHAM.) HENRY LEITNER EDWARDS. A Scheme of Qualitative Analysis, Involving the Use of Organic Reagents. (Doctoral dissertation.)

A scheme of qualitative analysis for the metals has been devised, in which advantage has been taken of the use of organic reagents. In some places the old accepted scheme has been followed, while in others it has been completely abandoned. One notable instance of this is the elimination of the use of hydrogen sulfide and the substitution therefor, as a precipitating reagent, of the combination of pyridine and the thiocyanate ion. Another is the application of organic compounds to the final identification of several of the elements. A third is the elimination of the need of the removal of arsenates and phosphates.

Briefly, the scheme divides the common metallic elements into five groups. Group I consists of silver, mercurous mercury and lead, which are precipitated by the chloride ion as the insoluble chlorides and identified as in the older schemes. Group II consists of arsenic and divalent mercury, which are identified by specific tests in the filtrate from Group I. Group III consists of iron, bismuth, lead, chromium, aluminum, antimony, tin, copper, cobalt, nickel, cadmium, zinc and manganese, which are precipitated as the hydroxides (in the case of iron, bismuth, lead, aluminum, chromium, antimony and tin) and as the complex pyridine-thiocyanates, (in the case of copper, cobalt, nickel, cadmium, zinc and manganese) by the pyridine-thiocyanate reagent. By treatment with ammonia and hydrogen peroxide, this precipitate is divided into two subgroups. The first of these consists of the hydroxides of iron, bismuth, lead, chromium, aluminum, antimony and tin, and hydrated manganese dioxide, while the second consists of the complex pyridine-thiocyanates of copper, cobalt, nickel, cadmium and zinc, which are soluble in ammonia. While manganese is precipitated as the complex pyridine-thiocyanate, this compound is decomposed by the

ammonia and hydrogen peroxide, and converted into the hydrated manganese dioxide. Each of these elements is then identified by a specific test. Group IV consists of barium, strontium and calcium, which are precipitated and identified as in the older scheme. Group V consists of magnesium, sodium, potassium and ammonia. These elements, with the exception of ammonia, which is identified in the original solution, are identified in individual portions of the filtrate from Group IV.

SAMUEL BRADLEY KNIGHT. The Composition of the Triple Sodium Uranyl Acetates of Zinc and Cadmium and Their Reaction with Sodium Hydroxide. The Determination of Sodium. (Master's thesis.)

Recently, sodium has been determined by first precipitating it as a triple sodium uranyl acetate of a bivalent metal, usually zinc. The triple salt may then be weighed as such, or titrated with standard sodium hydroxide. The former method is dependent upon the degree of hydration, while the latter is independent of it.

A study has been made of the reaction of the cadmium triple acetate with sodium hydroxide. The salt was found to react quantitatively with sodium hydroxide and in the same manner as the zinc salt.

Also the degree of hydration of the cadmium and zinc triple acetates has been determined with reference to furthering the volumetric method for the determination of sodium. Different lots of the zinc triple salt, precipitated under identical conditions, showed a constant degree of hydration of nine molecules of water. Under varying conditions, the cadmium triple salt gave hydrates from seven to nine molecules of water.

The determination of sodium using cadmium uranyl acetate as precipitating agent was unsuccessful because of the solubility of the salt.

(With EDWIN C. MARKHAM.) ELLA BATTLE MCDEARMAN. A Study of the Soda-Alum System. (Master's thesis.)

The system: sodium sulfate—aluminum sulfate—water was studied at 30° C and 25° C in the presence of 10% sulfuric acid. At 30° C, three solid phases were found to exist. These were, Na_2SO_4; $Na_2SO_4.Al_2(SO_4)_3.14H_2O$; and $Al_2(SO_4)_3$. The same three solid phases were also found to exist at 25° C. A preliminary study of the system at 0° C gave no evidence of compound formation. The presence of 10% sulfuric acid, in the system, prevented the formation of soda-alum at 30° C and 25° C and, also, prevented the hydration of sodium sulfate and aluminum sulfate at these temperatures.

H. D. CROCKFORD has directed the following research:

J. C. LOFTIN. (Doctoral dissertation.) The Activity Coefficients of Lead Chloride in Aqueous Solutions of Mannitol: An Investigation of the Ion-size Parameter.

The activity coefficients of lead chloride in aqueous solutions of mannitol have been determined at approximately .005, .01, and .023 molal lead chloride concentrations, with five different mannitol concentrations in each case. Also a series of five determinations was made with varying mannitol concentrations and a constant total molality but a varying ratio of lead chloride and barium nitrate. The activity coefficients were obtained from electromotive force measurements on the following cell: Pb-Hg/$PbCl_2$ (m_1)/AgCl,Ag.

From the activity coefficients the mean distance of closest approach of the ions was calculated for each case by means of the extended equations of LaMer, Gronwell, and Greiff for electrolytes of the type employed. These distances are found to decrease definitely as the concentration of mannitol is increased in the various solutions.

P. M. NICHOLES. (Progress on doctoral dissertation.) The Effect of Temperature Change on the Activity Coefficients of Lead Chloride in Barium Nitrate Solutions. An Investigation Concerning the Ion-size Parameter.

W. G. SINK. (Progress on doctoral dissertation.) The Potential of the Lead-Acid Storage Cell as Affected by Certain Organic Substances.

PROFESSOR CROCKFORD has continued his research work with the U. S. Naval Research Laboratory, Washington, D. C. The results are given in certain reports to the Navy Department.

RALPH W. BOST has published during the year:

(With J. H. WOOD.) Sulfur Studies. XI. Some Sulfur Derivatives of Benzaldehyde. *Journal of the American Chemical Society,* **59**: 1011. 1937.

(With J. H. WOOD.) Sulfur Studies. XII. Thioaldehydes in the Naphthalene and Anthracene Series. *Journal of the American Chemical Society,* **59**: 1721. 1937.

PROFESSOR BOST has directed the following research:

JOHN KENNEDY HODGES. The Sulfonation of Certain Aliphatic Hydrocarbons. (Doctoral dissertation.)

A study has been made of the action of fuming sulfuric acid on *n*-heptane and *n*-octane. This work has shown conclusively that the alkanes under the proper conditions can be directly sulfonated.

Heptane was treated with fuming sulfuric acid in an ice-bath, at 25° C, at 40° C, at 50° C, and at the boiling temperature of the hydrocarbon. The best yield and the purest compound were obtained at 25° C. Heptane was treated with 15%, 20%, 30%, 40%, 50%, and 60% fuming sulfuric acid. Larger yields were obtained with the stronger acid, but 20% fuming acid gave a better product. The best yields were obtained at room temperature when there were three moles of sulfur trioxide per mole of heptane. A reaction time of eight hours was found to give the best yields. Use of mercury salts did not increase the yields.

The barium and sulfur analyses indicated that the product obtained was a mixture of the salts of monosulfonic and disulfonic acid.

Butyl magnesium bromide was treated with sulfur trioxide in an ice-bath. The results would indicate that this procedure may prove a valuable method for the preparation of sulfonic acids.

JESSE HERMON WOOD. A Study of the Action of Inorganic Sulfides upon Benzaldehyde and Related Compounds. (Doctoral dissertation.)

Hydrogen sulfide was found to react with benzaldehyde in neutral or acid solutions to give polymerized thiobenzaldehydes of different kinds. In alkaline media, reactions designed to give thiobenzaldehyde gave dithiobenzoic acid, benzyl mercaptan, benzyl mercaptal of benzaldehyde, benzyl disulfide, and benzyl dithiobenzoate. The formation of these compounds was accounted for on the basis that monomeric thiobenzaldehyde was first formed and then reacted in a way typical of aldehydes. Several polymers of thiobenzaldehyde were vacuum distilled in the presence and absence of depolymerizing agents with results which indicated depolymerization to monomeric thiobenzaldehyde. Evidence that the Cannizzaro reaction goes through ester formation as an intermediate reaction was obtained.

It was shown that the compound reported by Fromm and Forster as benzyl dithiobenzoate was benzyl disulfide. An explanation of their error is given. A method for the preparation and detection of benzyl dithiobenzoate was discovered.

Thioaldehydes in the naphthalene and anthracene series were prepared by the action of hydrogen sulfide upon the corresponding oxoaldehyde and were found to be somewhat more resistant to polymerization than thiobenzaldehyde. Beta-ethoxy thionaphthaldehyde upon polymerization gave only one cyclic trimer. Thioanthracene aldehyde under the same conditions gave a linear polymer. This anomaly was accounted for on the basis of the prevention of ring closure by the large anthranyl groups.

A vacuum distillation of beta-ethoxy-trithionaphthaldehyde gave a good yield of *sym*—di-beta-ethoxynaphthyl ethylene. The unknown 2:4 dinitrophenylhydrazones of the aldehydes were prepared and characterized.

A brief survey of the literature on thioaldehydes and a discussion of the preparation of high molecular weight aldehydes is included in the first portion of the thesis.

ROBERT HACKNEY WILLIAMS. The Extraction and Utilization of Nicotine from Tobacco Waste. (For the master's degree.)

The tobacco used in this investigation was the nonmarketable product left standing in the field. This consisted mainly of stalks and stems and a few leaves. It was air-dried, crushed, and extracted with a petroleum fraction, using agitation and reflux methods with different alkalies of varying concentrations. The effect of time and number of extractions on nicotene recovery was studied. The agitation method using lime offered the greatest possibilities for total nicotine recovery.

The first compilation with bibliography of all the salts and complexes of dextro-nicotine, levo-nicotine, iso-nicotine, inactive-nicotene, and alpha-nicotine was accomplished. The name, formula, melting point, crystalline form, solubility, and physiological properties were also tabulated.

An investigation into the possibility of the production of beta-amino pyridine, a heterocyclic analogue of aniline, which is the basis for many dyes and drugs in the homocyclic series, was made. The studies showed that the conversion of nicotine into this substance is not commercially feasible.

J. E. EVERETT. (Progress on doctoral dissertation.) A Study of the Formation and Reactions of Thioketones.

A theory has been proposed to explain the mechanism of the Staudinger reaction and the validity of this theory has been tested with thioketones of various structures. The thermal stability and thermochromism of these compounds are now being studied. Phenyl para-hydroxy phenyl thioketone is an indicator of high tinctorial properties, exhibiting a deep blue color in acid solution and dark red in alkaline solution. The change occurs at a pH of 3 to 4.

FRANK NICHOLSON. (Progress on doctoral dissertation.) 2,4-Dinitrochlorobenzene as a Reagent in Organic Analysis.

2,4-Dinitrochlorobenzene has been shown to be an ideal reagent for phenols and amines. The derivatives of these two classes of compounds are well-defined, crystalline solids possessing sharp melting points. The reagent is also useful for the identification of alcohols and acids. Phenyl 2,4-dinitrophenyl ether has been selectively reduced, giving phenyl 2-amino-4-nitro phenyl ether and phenyl 2,4-diamino phenyl ether. The diazo reaction has been applied to these two compounds. Phenyl 2,4-dinitro phenyl ether has been studied with varying concentrations of sodium hydroxide at different temperatures and pressures. The results of these experiments will be reported later.

P. H. LATIMER. (Progress on doctoral dissertation.) The Effect of Molecular Structure on Certain Physical Properties of Aliphatic Sulfonic Acids.

The sulfonic acids from methyl through decyl have been prepared and characterized. Phenylhydrazine was found to be a valuable reagent for the identification of these acids. The phenylhydrazonium salts have definite melting points and may also be titrated with standard alkali, thus serving as a double check on their identity. The acids have been prepared in yields as high as 83 per cent by certain modifications of the Strecker reaction. A detailed description will be given later.

F. T. LAROCHELLE. (Progress on master's thesis.) Some Derivatives of Thiosalicylic Acid.

Thiosalicylic acid has been prepared in excellent yields by the reduction of dithiosalicylic acid with iron and hydrochloric acid. Some acyl derivatives have been prepared and characterized. Certain alkyl derivatives and their oxidation products are now under investigation.

PROFESSOR BOST has the following research in progress:

Conditions Affecting Gum Formation in Gasoline.

Pure hydrocarbons of different structures, boiling from 70 to 205° C, have been prepared. The effect of various concentrations of oxygen on these hydrocarbons is now being studied.

O. K. RICE has published:

(With R. A. OGG, JR., of Stanford University.) Factors Influencing Rates of Reaction in Solution. *Journal of Chemical Physics,* **5**: 140. 1937.

Internal Volume and the Entropy of Vaporization of Liquids. *Journal of Chemical Physics,* **5**: 353. 1937.

On Transitions in Condensed Systems. *Journal of Chemical Physics,* **5**: 492. 1937.

PROFESSOR RICE is directing:

C. V. CANNON. (Progress on doctoral dissertation.) A theoretical study of the phenomenon of fusion in carbon dioxide and nitrous oxide. Also an experimental study of the photolysis of azomethane in the presence of inert gases.

LEON GALLOWAY. (Progress on doctoral dissertation.) An experimental study of the kinetics of the decomposition of dimethyltriazene.

E. P. H. MEIBOHM. (Progress on doctoral dissertation.) A study time of initiation of photochemical chains in organic substances by the rotating sector method.

PROFESSOR RICE is finishing a book on application of atomic and molecular theory to inorganic chemistry.

JAMES E. MAGOFFIN has had accepted for publication:

(With PROFESSOR W. D. BANCROFT, Cornell University.) Energy Levels in Electrochemistry, III and IV, now in press, *Journal of the Franklin Institute.*

PROFESSOR MAGOFFIN has submitted for publication:

Fundamental Properties of Textile Mill Wastes, II. Electrophoresis. *Textile Research.* One of a series of papers to be published in connection with work now in progress.

He has completed the following researches:

Migration Velocity Studies on Sodium Oleate and Platinum Sols. (Read before the American Chemical Society, Chapel Hill Meeting, April, 1937.)

The Solid Phase in Dispersed Systems. (Read before the Colloid Symposium, Minneapolis Meeting, June, 1937.)

He has the following research now in progress:

The study of the fundamental properties of components of textile mill wastes is being continued under a grant from The Textile Foundation.

E. C. MARKHAM has directed the following research:

S. B. KNIGHT. (Progress on doctoral dissertation.) Determination of the Structure of the Ammonium Ion.

PROFESSOR MARKHAM and PROFESSOR DOBBINS have directed the following research:

H. L. EDWARDS. A Scheme of Qualitative Analysis Involving the Use of Organic Reagents. (For the doctor's degree.)

ELLA BATTLE MCDEARMAN. A Study of the Soda-Alum System. (For the master's degree.)

(For abstracts, see pp. 17-18 this bulletin.)

T. R. KIMBROUGH. (Progress on master's thesis.) The inclusion of molybdenum, titanium, tungsten, and vanadium in the scheme of qualitative chemical analysis as proposed by Dobbins, Markham, and Edwards.

SHERMAN E. SMITH has continued the study of the Permeability of Cellulosic Membranes to Gases and Vapors. This work was sponsored by E. I. du Pont de Nemours and Company. W. W. OWEN is at present also engaged in this research.

It has been shown that the penetration of "Cellophane" and other cellulosic membranes takes place through a solution process. The rate of transpiration of a gas through a moist cellulose film is proportional to the water solubility of the gas. This fact has been demonstrated for a number of moderately soluble and slightly soluble gases. At present the work is being extended to include the gases and vapors of relatively great solubility.

DEPARTMENT OF CLASSICS

Studies published during the past year:

J. PENROSE HARLAND:

The Fourteenth Century in the Ancient World. *American Journal of Archaeology,* XLI: 1: 114-115. 1937.

G. A. HARRER:

Review of Jean Gagé, *Res Gestae Divi Augusti.* Paris. 1935. *American Journal of Philology,* LVIII: 2: 247-250. 1937. (With the assistance of DR. A. I. SUSKIN.)

R. P. JOHNSON:

Continental Manuscripts of the Mappae Clavicula. *Speculum,* XII: 84-103. 1937.

This is the concluding one of a series of three articles, the earlier ones being, "Notes on Some Manuscripts on the Mappae Clavicula," *Speculum,* X: 72-76. 1935; "Additional Notes on Some Manuscripts of the Mappae Clavicula," *ibid.:* 76-81, in which the author presents the discoveries made in searching for manuscripts of the work in European libraries under a fellowship from the American Council of Learned Societies. The Mappae Clavicula, one of the three or four outstanding documents in the history of the technique of painting and its allied arts during the Middle Ages, previously known to exist in some three or four manuscripts, is now shown to be extant in some eighty-odd manuscripts located in five countries and dating as early as the beginning of the ninth century.

Research in progress:

J. PENROSE HARLAND:

The Site of Troy. (Article.)

The Helladic Civilization. (Book.)

G. A. HARRER and A. I. SUSKIN:

Fasti Consulares: A Second Supplement to Liebenam's work.

R. P. JOHNSON:

The *Compositiones Variae,* an Introductory Study.

The Manuscripts of the Schedula of Theophilus Presbyter.

The *Compositiones Variae,* text, commentary and translation.

The *Mappae Clavicula,* text, commentary, and translation.

Microphotography and its application to Classical Scholarship.

A. I. SUSKIN:

(With LUCILE KELLING.) Index Verborum Iuvenalis.

Fasti Consulares. (See above under HARRER.)

The following doctoral dissertation was completed during the year under the supervision of the Department:

A. I. SUSKIN. The Arrangement of Material in Livy, Books 31-45. (Under the direction of G. A. HARRER.)

The subject of the present study is Livy's method of composition in Books 31-45 of his *Ab Urbe Condita.* An analysis and outline of the narrative is presented, followed by discussions of Livy's use of the annalistic method, transitional devices, and his book division. On the whole the narrative is chronological and annalistic; the history of one year is completed before that of the following year is begun; accounts of contemporaneous events in different fields of Roman activity are kept related by the skillful use of transitions. The books are not divided according to any rigid rule; when a book does not end with the close of a year or with the cessation of a year's activity in some sphere of Roman interest, it ends with a climax, the effect of which would be spoiled by the continuation of the same account in the following book. By the inclusion of speeches, character sketches, digressions and accounts of prodigies, Livy varies his method of presentation of material and avoids the monotony which would otherwise be inevitable in a long historical narrative. This study shows that, apart from the chronological and annalistic framework, Livy adhered to no fixed scheme in presenting his material. His guiding motive throughout is to afford variety and to entertain as well as to inform the reader.

The following master's theses were completed during the year under the supervision of the Department:

THOMAS MOORMAN SIMKINS, JR. Claudii Mamertini Gratiarum Actio Iuliano Imperatori: A Translation, with Introduction and Notes. (Under the direction of G. A. HARRER.)

This study of the *Gratiarum Actio* of Claudius Mamertinus consists of three parts. First, in the introduction is given a summary of the characteristics of the ancient panegyric as a form of literature, followed by detailed information concerning the *XII Panegyrici Latini* (the group of panegyrics which includes the speech of Mamertinus), the historical background of Mamertinus' oration, the available facts of the orator's life, and the characteristics of his speech. Secondly, the full Latin text of the speech is given, with the English translation on opposite pages. Thirdly, explanatory notes relating to the orator's allusions to historical, geographical, and mythological matters, his imitations of classical authors, and the language and style of the speech, are included. It is made clear that Mamertinus, like other orators of the fourth century, imitated the classical writers closely; that his speech was sincere; and that he was a pagan of education and ability.

VIRGINIA BECKETT SIMKINS. Panegyricus Theodosio Augusto by Latinius Drepanius Pacatus. (Under the direction of G. A. HARRER and S. G. SANDERS.)

In 388 A. D. Maximus, who usurped the power in Western Europe and ruled tyrannically in Gaul for five years, was defeated by Theodosius, Emperor of the East. The Gauls sent an ambassador to convey their gratitude to Theodosius. This representative was the Gallic rhetorician, Latinius Drepanius Pacatus. This study is a translation of his speech of gratitude, a panegyric delivered to Theodosius. In addition to the translation there are sections discussing the place, the date, and the occasion of the oration as well as a section on the orator. There are also sections on vocabulary, syntax, stylistic qualities, and possible imitations of earlier writers. Following the translation are explanatory notes on the geographical, historical, legendary, and mythological references found in the speech.

The following studies have been undertaken by candidates for advanced degrees:

B. W. DAVIS. The Administration of the Province of Crete and Cyrenaica. (For the doctor's degree.)

EVELYN WAY. Seneca's Influence on Later Historians. (For the doctor's degree.)

Eloise Baynes. The Scholia on Cicero's *Pro Milone.* (For the master's degree.)

Ida Louise Hunter. Panegyricus Constantino Augusto Dictus by Nazarius. (For the master's degree.)

DEPARTMENT OF DRAMATIC ART

The following three-act plays were accepted during the year by the Department, in lieu of the research thesis, for the master's degree:

Gerd W. Bernhart. From Heaven Down, a Play of Domestic Relations. (Under the direction of Samuel Selden.)

The play presents the problems confronting a young artist who feels the need to leave the small, mid-western town of Prairie Creek in Minnesota. In her fight for freedom, the main character is forced to destroy the illusions of traditional conduct.

The play also endeavors to indicate the problems of assimilation of Scandinavian immigrants in the mid-west.

Francis Marion Durham. Like Foolish Prophets: A Satirical Play of a University Reformer. (Under the direction of Frederick H. Koch.)

Like Foolish Prophets is the story of an idealist in conflict with the conventions of a small state-supported university. The play presents a satirical picture of the young reformer and attempts to show the reactions of the university officials and students to her efforts at reformation. Both the reformer and the institution are treated satirically, and the play has as its thesis that the chief evils of present-day colleges are educational systems subservient to politics, and the lack of students with a serious desire for knowledge. The action of the play is built around the characters of the reformer, the typical co-ed, and the university president.

Beverly du Bose Hamer. Funeral Flowers for the Bride: A Comedy of Mountain People. (Under the direction of Frederick H. Koch.)

This original three-act play presents a group of warm, homely characters whose doings are intended to fulfill the fundamental function of comedy from the beginning—to provide innocent mirth. The plot concerns Zeke Cash's efforts to subjugate his obstreperous daughter, Ruby—a program involving his marrying for the fourth time, and over his third wife's coffin. The locale is the Blue Ridge Mountains of South Carolina.

Josephina Niggli. Singing Valley, a Play of a Mexican Village. (Under the direction of Samuel Selden.)

Young Mexicans from small villages very often go to the United States to school. On their return they are faced with the problem of adjustment to their old environment. The old simplicity and the new sophistication fight for possession of them. Which wins? Does living too long in a foreign country make the individual an exile when he comes home at last? Here is the problem of this drama.

WILLIAM PEERY. 13 Piccadilly Terrace: A Play of Byron, the Chameleon. (Under the direction of FREDERICK H. KOCH.)

This original three-act play portrays the drama of Lord Byron's marriage, separation, and "exile." Its importance lies in its picture of Regency England and in its conception of the character of Byron—as a retarded adolescent and impractical idealist who, disillusioned about fame, love, and marriage, refuses to be disillusioned about his high self-evaluation. While a mob of outraged citizens storms his house, he swaggers out by the rear way, confident of his kingship among men and immortality among the gods.

JOHN W. PARKER. Itching Heel: A Play of Negro Life in Eastern North Carolina. (Under the direction of FREDERICK H. KOCH.)

In Eastern North Carolina those who are too heavily endowed with the lure of the wanderlust, the innate longing for greener fields, the thrill of eternally searching for that illusive something which lies "just around the bend of the road," are said to be cursed with an itching heel. Their dissatisfaction with the stable elements of life causes them to strain at the leash of circumstance, and their life-patterns are constantly in a state of flux. The story of Duck, the girl with an itching heel, is presented against the background of a small Negro settlement just outside the old, colonial town of Murfreesboro, overlooking the Meherrin River. Although the incidents are drawn from their realistic, workaday world, they are colored with quaint colloquial and racial superstitions. The dialect used in the play is that of the Negro in this section of the state, remarkably similar to that of the "poor white," but infinitely more earthy and picturesque.

WALTER SPEARMAN. Free Indeed, a Drama of the Conflict Between Liberalism and Conservatism in a North Carolina High School. (Under the direction of FREDERICK H. KOCH.)

This play depicts the efforts of a liberal young principal to make reforms in the public high school system and to emphasize the importance of teaching pupils to think rather than what to think. With truth in teaching as his criterion, he encourages a student peace parade on Armistice Day, a survey of city government and living conditions in the mill village by students of the civics class, and a study of modern realistic plays in connection with the teaching of English. His ideas are bitterly opposed by ultra-conservative members of the school board and com-

munity, who try in vain to oust him for his liberal ideas, but finally succeed in defeating him by bringing trumped-up charges against his personal conduct with one of the teachers.

The following master's thesis was accepted during the year by the Department:

DON ALBERT WATTERS. The Modern Approach to Stage Design As Exemplified in the Work of Three Scenic Interpreters of Eugene O'Neill. (Under the direction of SAMUEL SELDEN.)

This thesis shows how out of the thinking and experimentation of the late nineteenth and early twentieth centuries has been evolved the modern American stage designer's approach to designing. The theories and methods of three artists, Robert Edmond Jones, Lee Simonson, and Cleon Throckmorton, are shown to be representative of those of the modern stage designer in general.

The main part of the thesis is devoted to a study of the application of the theories of these three artists to the settings for eight plays by Eugene O'Neill. The plays are *Desire Under the Elms, The Fountain, The Great God Brown, Mourning Becomes Electra, Marco Millions, Dynamo, The Emperor Jones,* and *The Hairy Ape.* The designers have been found to be successful, on the whole, in their scenic interpretations of the plays.

DEPARTMENT OF ECONOMICS AND COMMERCE

E. E. PEACOCK is directing the following research:

W. W. HOWELL. (Progress on master's thesis.) A System of Cost Accounting for a University Cafeteria.

ERICH W. ZIMMERMANN has published:

A review of Rowe, J. W. F., *Markets and Men: A Study in Artificial Control Schemes in Some Primary Industries. The Southern Economic Journal,* III: 2. October, 1936.

A review of Kepner, Charles David, Jr., and Soothill, Jay Henry, *The Banana Empire: A Case Study in Economic Imperialism. The Southern Economic Journal,* III: 3. January, 1937.

A review of Kepner, Charles David, Jr., *Social Aspects of the Banana Industry. The Southern Economic Journal,* III: 3. January, 1937.

A review of Dalton, John E., *Sugar: A Case Study of Government Control. The Southern Economic Journal,* IV: 1. July, 1937.

A review of Watkins, Myron W., *Oil: Stabilization or Conservation. A Study in the Organization of Industrial Control. The Southern Economic Journal,* IV: 1. July, 1937.

R. J. M. HOBBS has in progress:

Cases and Statutes Dealing with Government Control of Business.

JOHN B. WOOSLEY has published:

A review of Chapman, Charles C., *The Development of American Business and Banking Thought. The Southern Economic Journal,* III: 337-339. January, 1937.

He has in progress in collaboration with the Research Committee of the North Carolina Bankers Association:

An Analysis of the Assets, Liabilities, Earnings, and Expenses of North Carolina Banks, 1927-1936.

A Study of State Bank Failures in North Carolina, 1921-1933.

CLARENCE HEER has published:

The Probable Effects of the Social Security Act on State and Local Finances, *Proceedings of Twenty-ninth National Tax Conference,* 1936.

He has in progress:

Economic and Fiscal Aspects of Federal Aid to Education. (For President's Advisory Committee on Education.)

The Financing of Social Security in the South.

PROFESSOR HEER is directing the following research:

C. H. DONOVAN. (Progress on doctoral dissertation.) Fiscal Readjustments in North Carolina, 1929-1937.

F. H. BUNTING. (Progress on doctoral dissertation.) Federal-State Relations in the Financing of Relief.

C. E. KUHLMAN. (Progress on doctoral dissertation.) The Operating Results of Municipally-owned Public Utilities in North Carolina.

G. T. SCHWENNING has published:

A review of Wootton, Barbara, *Plan or No Plan. The Journal of Business of the University of Chicago,* X: 100-101. January, 1937.

Professor Schwenning is continuing his study of The Dismissal Wage.

As Managing Editor he has assisted in editing Volume III, Nos. 2, 3, 4, and Volume IV, No. 1, of *The Southern Economic Journal.*

H. D. Wolf has published:

The Place of Social Security in Our Economic Life, *Southern Economic Journal,* III: 3. January, 1937.

A review of *What Employers Are Doing for Employees,* by The National Industrial Conference Board. *The Southern Economic Journal,* III: 2. October, 1936.

A review of *Workmen's Compensation in Pennsylvania,* by The Department of Labor and Industry, Commonwealth of Pennsylvania; and *Workmen's Compensation in Maryland,* by Evelyn Ellen Singleton. *The Journal of Political Economy,* XLV: 1. February, 1937.

Professor Wolf is directing the following research:

C. P. Anson. (Progress on doctoral dissertation.) The History of the Labor Movement in West Virginia.

M. H. Eakins. (Progress on master's thesis.) Labor Standards on Public Works Financed by Federal Funds.

D. H. Buchanan has published:

A review of Mukhtar, A., *Trade Unionism and Labor Disputes in India. The American Economic Review,* December, 1936.

A review of Bernie, Arthur, *An Economic History of the British Isles. The Southern Economic Journal,* December, 1936.

A review of Dey, Hirendra Lal, *The Indian Tariff Problem: In Relation to Industry and Taxation. The Journal of Political Economy, February,* 1937.

A review of Appadorai, A., *Economic Conditions in Southern India* (1000-1500 A.D.), Vols. I and II. *The American Economic Review,* March, 1937.

He has in progress:

Studies in Japanese Industrial and Commercial Development.

HERBERT VON BECKERATH has published:

Some International Aspects of Capitalism and Its Present Crisis. *The Southern Economic Journal,* II: 2: 115-142. 1936.

Book reviews in the *American Economic Review* and *Schmoller's Jahrbuch.*

He has accepted for publication:

One Hundred and Fifty Years of Economic Thought in *The American Philosophical Review.*

A series of lectures which were delivered in June at the Institución Hispano-Cubano de Cultura, Habana, on El Problema de la Economia en la Crisis de la Cultura to be published by the Casa Editorial Ercilla, Santiago de Chile.

He has in progress:

A book on The Spirit and Form of Occidental Civilization.

The main theme of this book is the interaction of social and political institutions and economic life, and the conditions of harmony and compatibility between both spheres.

E. M. BERNSTEIN has published:

Graphic Presentation of Trend Data (with DUDLEY J. COWDEN). *The Southern Economic Journal,* III: 4. April, 1937.

A new type of graph paper that permits the plotting of related trend and non-trend data is explained and illustrated in this article. It is believed that this type of graph paper will be useful for exploratory work, particularly in business cycle studies.

He has had accepted for publication:

Public Utility Rate Making in Depression. *Quarterly Journal of Economics,* November, 1937.

The difficulties of public utility rate making in a period of severe depression are briefly stated, and the methods used by commissions during the recent great depression are critically considered.

Public Utility Rate Making and the Price Level. Chapel Hill: *University of North Carolina Press,* 1937.

The great fluctuations in prices and in interest rates have prevented effective regulation of utility rates in the past twenty years. But even the instability of prices and interest rates would not have been an insurmountable obstacle to effective regulation if a satisfactory rate making

rule had been available. During the World War, and again in the great depression, commissions developed new methods of rate making to cope with the problem of rapidly changing prices. It is the purpose of this study to show how the rate making rule and its procedure were developed, to consider the difficulties that were encountered under this rule, to discuss the new methods of rate making used by commissions in the periods of rapidly changing prices, and to offer a reasonable solution for the rate making problem.

He has in progress:

A paper on Rates of Remuneration and the Price Level.

A paper on Interest Rates and Business Cycles.

PROFESSOR BERNSTEIN is directing the following research:

EARL HICKS. (Progress on master's thesis.) The Monetary Theories of Alexander Del Mar.

MALCOLM D. TAYLOR is continuing his survey of the research work in Marketing in progress in universities and colleges throughout the United States. Summaries of parts of this study have appeared under the titles "Progress in Marketing Research" and "Progress in Marketing Research—Research in Universities" in the following publications:

The Journal of Marketing, I: 2: 156-168. October, 1936.

The Journal of Marketing, I: 3: 283-294. January, 1937.

The Journal of Marketing, I: 4: 407-411. April, 1937.

The Journal of Marketing, II: 1: 71-77. July, 1937.

Further reports on this survey will appear in the October, 1937, and January, 1938, issues of *The Journal of Marketing.* This journal is published quarterly by the American Marketing Association.

M. S. HEATH has in progress:

Southern Transportation History.

PROFESSOR HEATH is directing the following research:

F. S. WILDER. (Progress on doctoral dissertation.) Some Class Variations in Standards of Living in North Carolina.

D. J. COWDEN, in collaboration with F. E. CROXTON of Columbia University, has in progress:

Applied General Statistics. To be published by Prentice-Hall in the course of the next six months.

R. S. WINSLOW has in progress:

A section on "Conflicting Interests" in a book on Economic Problems being edited by Willard Thorp.

The following doctoral dissertations were completed during the year:

EDWARD HUTCHINGS ANDERSON. The Process of Internal Organization. (Under the direction of GUSTAV THEODOR SCHWENNING.)

The process of internal organization is taken to mean the methods of procedure and the principles involved in constructing and perfecting internal organization. Internal organization is that aspect or phase of organization which is concerned with the interrelationships of the parts or the members within the business enterprise or productive establishment. There are excluded, therefore, the relationships of the organization as a whole with outside parties or to outside conditions. Organization is defined, and used here, in its narrower sense, which includes only the relationships of the members of the personnel with the work to be done, with one another, and with the management and control of the productive unit. It is therefore not primarily concerned in technology or layout or systematization, which are usually included in the broader meaning of organization.

Since the subject of organization as here treated is regarded as a science, comparable with other sciences, an attempt has been made to find some elemental unit that will serve in this field as does the atom in chemistry or the cell in biology. The only unit so far developed that may be adapted for this purpose is the "therblig," a unit of manual labor. This unit is not only the atom of organization structure and the basic unit in management, but is also a unit which offers possibilities for serving as a labor unit of value. In fact, the whole economic philosophy of scientific management is conceived in terms of some such unit of use value.

The process of organizing begins thus with the "therblig" as the basic unit and proceeds by combining these units to constitute operations, which are then combined to constitute the industrial processes and systems, and the tasks and jobs for individual performance. The synthesis continues by uniting jobs to comprise functions, departments, and the divisions which together form the complete organization. Finally, this process has its applications in the formation and operation of huge, integrated enterprises and of whole, rationalized industries.

In the process of combining the jobs and functions of the various workers, specialists, and supervisors for the purpose of controlling their respective activities, there are differentiated several typical control rela-

tionships, or types of organization, as they are usually called. There are certain distinctive characteristics of each type, certain factors and conditions which tend each to determine a certain structural type, and also certain relative advantages and disadvantages of each which indicate its practical serviceability. Moreover, it is possible to distinguish and summarize various principles and laws having to do with the construction and improvement of organizations of all structural types. Finally, upon analysis of the principles and purposes of organization, it is seen that a scientifically developed structure may accommodate control in accordance with the principles of scientific management and simultaneously in accordance with industrial democracy, two methods commonly thought to be incompatible.

BRANTSON BEESON HOLDER. The Three Banks of the State of North Carolina, 1810-1872. (Under the direction of JOHN B. WOOSLEY.)

This study is an analysis of the organization and operations of the three banks of the State of North Carolina which were partially owned and controlled by the state and definitely identified as state agencies.

The history of these three banks, together with the evolution of banking practices and theory during the period, has been traced. The relationships between banking policies and the economic development of the state has been explored, along with the repercussionary effects on the banks of gold discoveries and gold movements, internal and external trade balances, financial crises, and federal fiscal policies. The inter-bank relations with the Second United States Bank are analyzed.

The first bank had an authorized capital of $1,600,000, of which the state owned $305,000. In addition to the parent institution at Raleigh, the bank had six branches in other towns. It was permitted to issue notes up to three times the authorized capital plus the money on deposit. These notes had a wide circulation. The bank was limited in its operations to lending money on promissory notes, dealing in gold and silver and bills of exchange. It was a depository for the state and federal governments. The substantial profits accruing to the state were used until 1823 to retire the state currency and thereafter to defray current expenses.

The second bank was organized in 1834 with a paid-in capital of $1,500,000, of which the state owned $502,700. The method of control, the relationship of the bank to the state, and the operations of the bank were in general similar to those of the first institution. It had a successful career and paid an average annual dividend of more than eight per cent on the par value of its stock and returned the capital in full to the stockholders upon liquidation.

The third bank was substantially a continuation of the second. It was organized in 1859 with an authorized capital of $2,500,000, of which the state owned $502,700. The note issue was limited to twice the paid-in capital or three times the specie reserve, whichever was smaller. The

bank began operations under very favorable circumstances, but soon after the outbreak of the Civil War its activities were severely curtailed. It loaned $300,000 to the state for war purposes, but it did not purchase bonds of the Confederacy or of the state, except to exchange state and Confederate currency held in its vaults for bonds. These became worthless after the war and the bank was forced to liquidate, whereupon it paid its note holders and depositors twenty-five per cent in specie or its equivalent.

JOHN BERRY MCFERRIN. Caldwell and Company: A Study in Southern Investment Banking. (Under the direction of JOHN B. WOOSLEY.)

This study analyzes the development and collapse of Caldwell and Company, an investment banking house founded in 1917 by Rogers Caldwell in Nashville, Tennessee. Beginning as a small southern municipal bond house with no capital, its early operations were financed by buying bonds under depository agreements, by which the resulting deposits were generally made in the Bank of Tennessee, which was established and wholly owned by Caldwell and Company, and which was housed in the same building and staffed by the same personnel. Successful operations in municipal bonds enabled the organization to acquire control of a substantial volume of funds which were used to expand its underwritings into real estate bonds and industrial securities and to bring under its control a large number of industrial and financial institutions.

Caldwell and Company acquired in time the controlling stock of industrial corporations with assets of approximately $50,000,000, insurance companies with total assets of more than $220,000,000, and banks with assets in excess of $210,000,000. In line with other investment houses of the twenties, it established an investment trust, Shares-in-the-South, Incorporated. Finally, it acquired control of two newspapers, the *Memphis Commercial-Appeal* and the *Knoxville Journal.*

In its newspaper ventures, as well as in some other operations, Rogers Caldwell acted jointly with Luke Lea, a prominent Tennessee politician. These joint ventures deeply involved Caldwell and Company in Tennessee politics and were partially responsible for the election of Henry H. Horton as Governor of Tennessee, who furthered the company's interests by depositing more than $8,000,000 of state funds in the Bank of Tennessee during 1929 and 1930.

The height of the company's power was reached in 1929, when its controlled assets amounted to more than $500,000,000. The collapse of the security markets in 1929 caught the company in a greatly over-extended position, from which it sought relief in part (1) through a merger with BancoKentucky Company, which controlled several banks, including the National Bank of Kentucky of Louisville, and (2) by shifting the burden of heavy commitments in the insurance field to its controlled Inter-Southern Life Insurance Company of Louisville. These transactions served only to improve temporarily the company's financial condition. Meanwhile

other long standing weaknesses, including numerous violated trust agreements and lack of capital and proper internal controls, were intensified.

The collapse came in November, 1930, when the closing of the Bank of Tennessee was followed by the failure of Caldwell and Company and most of its controlled banks. Among the results arising directly from the crash were an effort to impeach the Governor of Tennessee and numerous criminal and civil actions against Rogers Caldwell and his associates. Meanwhile, the Caldwell empire was liquidated, with the result that the unsecured creditors of Caldwell and Company received 0.4129 of 1 per cent of their claims, and depositors in its controlled banks, policyholders of its insurance companies, and investors in the securities it had underwritten suffered severe losses.

Merton Ogden Phillips. Tramp Shipping: Its Changing Position in World Trade. (Under the direction of Erich W. Zimmermann.)

The tramp ship, first under sail and then under steam, seeking and carrying the world's low valued and bulky cargoes, owed its origin to the definite need for an economical carrier that could meet the diverse requirements of many routes and many trades. As a result of the tremendous growth of trade in mass consumption goods, the importance of seasonality and variability in the export movement of a large portion of such commodities, the use of the cable, the opening of the Suez Canal. and the perfection of the compound engine, tramp steamers achieved a position of first importance in world shipping. At the end of the nineteenth century tramps exceeded liners in number, tonnage, and carrying power.

During the twentieth century tramp shipping continued to gain in absolute importance and enjoyed its greatest prosperity during the years 1912 to 1920. From 1920 to 1936 tramp shipping was afflicted by a prolonged depression, which was alleviated to some extent in 1927-1929 but which reached the proportions of a crisis in 1930-1935. The relative importance of the tramp, however, has been subject to a continuous decline since the early years of the century. Between 1914 and 1933 tramp tonnage declined from 22.7 to 21.3 million gross tons, whereas the tonnage of all other types of vessels increased from 26.4 to 46.7 million gross tons. As a result of the growing importance of combination passenger and cargo liners, specialty carriers, industrial carriers, general cargo liners, and tramp-liners, the tramp's share of world trade has greatly declined. In particular, British tramp tonnage has decreased to about one-half of its pre-war size, while Japanese, Greek, and Italian tramp tonnage, consisting chiefly of second-hand vessels, has increased.

Among the basic causes that contributed to the decline of the tramp and to the ascendency of other types of carriers have been: (1) carrier developments, especially the trend toward specialization in ship construction, the continued cheapening of speed, and the shift in fuel from coal to

oil; (2) cargo developments, such as the drastic decline of the British coal trade, the growing tendency to ship manufactured or processed goods instead of raw materials and crude foodstuffs, the reduction of seasonality and irregularity in the movement of bulk cargoes, and the greater demand for speed and regularity in transport; and (3) general developments, especially the growing trend toward vertical integration of industry, accompanied by the development of the industrial carrier, and the intensification of the movement toward economic nationalism since the World War, marked by a rise in trade barriers and a great increase in subsidies for liner shipping.

As a result of changed conditions in world trade and shipping, the position of the tramp has changed. It will continue to serve many purposes in world shipping, but its relative importance will continue to decline. In order to cope with increased competition, improved steam tramps are being constructed today, but the most important change has been the tendency to build Diesel tramps instead of tramp steamers.

The following master's theses were completed during the year:

RUFUS CARSON COX, JR. A Standard Cost System for an Ice Cream Company. (Under the direction of E. E. PEACOCK.)

This thesis is an attempt to adopt Standard Cost methods to accounting for the manufacture of ice cream. The word "Standard" is used in the sense of a unit of measure, a yardstick with which to compare present performance. By the use of a "Standard" an attempt is made to transform the cost accounting system from a mere fact-finding device into a measure of business efficiency.

A budget based on estimated sales and production costs is set up for the coming year and all expenses are prorated to each of the processes and products on the basis of these estimates. Carrying this through to the final stage in each process and product, and dividing by the estimated production of each, a normal or "Standard" Cost is thus determined.

Actual costs are found in the usual manner of process cost accounting, and the "Standards" as set up above are compared therewith.

The variance from "Standard" affords a measure of business efficiency and gives warning when investigation is necessary to determine the cause thereof.

JAMES FLOYD FLETCHER. The Origin and Development of the Carolina Power and Light Company, 1881-1925. (Under the direction of JOHN B. WOOSLEY.)

The Carolina Power and Light Company, conceived by General Electric interests, was created in 1908 as the result of the consolidation of several small operating electrical units centering around Raleigh. North Carolina. Simultaneously and under the same control the Asheville Power and Light

Company was operating in and around Asheville, North Carolina. During 1911 the Yadkin River Power Company was created by these interests to serve as a wholesaling agent for the Carolina Power and Light Company and certain other concerns operating in North and South Carolina, and to serve as retailing agent, also, in the area southeast of and contiguous to that served by the Carolina Power and Light Company. In 1926, in order to be able to render more efficient service to the consuming public, the Carolina Power and Light Company, the Asheville Power and Light Company, and the Yadkin River Power Company, all of which were controlled by the Electric Bond and Share Company, were consolidated along with other concerns of minor importance, into a new Carolina Power and Light Company.

These several concerns were created at the time when it had become apparent that the sale of electricity for motive power and retail consumption was both mechanically and financially feasible. From small operating units they grew into concerns of sizeable proportions. Their steady and profitable growth was due to (1) the technological developments in the electrical industry which made the use of electricity an essential factor in our economic life, (2) the industrial development of North Carolina which was partly caused by the abundant supply of cheap electric power, and (3) the advantages of having well-trained engineers, financial experts, and other administrative officials at their call through a service contract between the Carolina Power and Light Company and the Electric Bond and Share Company.

Throughout the period the presidents of the Carolina Power and Light Company were North Carolinians, but the members of its board of directors were largely chosen from those intimately connected with the Electric Bond and Share Company or its affiliates. The company's expansion was financed largely through the issuance of bonds with secondary reliance on preferred stock. The bonds were largely distributed by northern investment houses, but a rather intensive campaign for customer ownership of preferred stock was maintained in the area served. The common stock was issued primarily as the promoter's profit and served as the instrument of control for the parent companies.

Alton Guy Sadler. A Proposed System for Financing Student Activities in a Southern University. (Under the direction of E. E. Peacock.)

A study of various systems of student financing of campus organizations was made with special emphasis on the systems in use at the University of North Carolina, Woman's College, and North Carolina State College of the University of North Carolina, Trinity College and Woman's College of Duke University, Purdue University, and the University of Illinois. To enrich this investigation letters and bulletins from administrative and financial officials from many universities and colleges were obtained.

The thesis is a composite plan for a proposed system of financing student activities in a southern university of about 1,800 students. Financing, administration, control, accounting, auditing, and statements are discussed extensively. Examples and illustrations with actual forms in use are herein presented.

NIHAT FERIT YAPAR. Wastes in the Marketing of Manufactured Products. (Under the direction of MALCOLM D. TAYLOR.)

This is an analysis of the wastes involved in the marketing of manufactured products. Wastes in five fields of marketing—wholesaling, retailing, transportation, salesmanship, and advertising—are discussed in detail. Remedies, both those that have been found by experience to be practical and those that have yet to be tried, or that are at present in the experimental stage, are suggested for the elimination of these wastes. An attempt has been made, in so far as is possible in view of the paucity of accurate data on the detailed costs involved, to explain each marketing process in the light of what functions it ought to perform, what functions it actually does perform, and what agencies have been applied, or should be applied, to the correction of malfunctioning. The final chapter deals with the interests of consumers in the problem and discusses methods that have been undertaken by consumers themselves, or by governmental and private agencies acting in their behalf, to correct the situation.

DEPARTMENT OF EDUCATION

EDGAR W. KNIGHT has published:

A Study of Hampton Institute.

This is a survey conducted by PROFESSOR KNIGHT and twelve specialists, at the request of the Trustees of Hampton Institute in Virginia, which was established in 1868 for the purpose of providing a practical education for the former slaves and their children. The study, in three parts, deals with the present organization, the curricula, and financial administration and is accompanied by an Appendix which contains numerous statistical tables.

Some Literature of Education in the United States, 1936. *The Social Studies,* XXVII: 8. December, 1936.

Indoctrination for a New Social Order? *Junior College Journal,* VII: 8. 1937.

PROFESSOR KNIGHT is engaged on a study of the History of Educational Objectives for the Educational Policies Commission of the National Education Association, to be published in the fall of 1937.

He is also engaged on a study of ideals and policies in American higher education since 1860, as these are revealed in the inaugural addresses and reports of leading university presidents.

A. M. JORDAN has published:

Who Goes to College? *High School Journal,* January, 1937.

This investigation undertook to study the test scores of 19.000 seniors who were members of the senior class of the North Carolina high schools during 1935. The test that all these pupils had taken was the North Carolina High School Senior Examination. It consisted of carefully prepared tests on reading ability, English literature, English language, mathematics, science, and history. The test as a whole consumed more than an hour and a half of each pupil's time and had satisfactory reliability. As a whole those students who state that their intention is to go to college make somewhat higher scores than those electing to stay at home. On the other hand, "Our data show conclusively that literally thousands of students who are scholastically able to do so are *not* continuing their academic training, while other thousands of students with the poorest abilities are attempting to continue their work in academic halls."

PROFESSOR JORDAN has completed a second article respecting the differences in scores between 7,500 senior boys and 7,500 senior girls on the North Carolina High School Senior Examination.

He has practically completed a study of the effect of differing parental vocations upon the scholastic achievements of their children.

PRESTON C. FARRAR has published:

What Shall We Do About *Shall* and *Will?* *High School Journal,* November, 1936.

This is a study of the results of a questionnaire on habitual uses of *shall* and *will* in the speech of the faculty of the University of North Carolina.

CARLETON E. PRESTON delivered an address before the National Education Association in Detroit on June 28, 1937, on the subject, Should the Subject Matter of Science Determine Teaching Objectives? This address is to be published in the *Proceedings* of the Department of Science Instruction of the Association for 1937.

HUGO GIDUZ has published:

1936 Placement Tests in French at the University of North Carolina. *High School Journal,* November, 1936.

This study shows that of all the students taking the placement tests in French 47.14% were put back into French 1; of the North Carolina students, 64.55% were placed into French 1, and of the out-of-state students 24.30% were placed in the same course. Of the total 17.41% were placed in French 11X; 14.28% of the North Carolina and 21.53% of the out-of-state students were placed into 11X. 35.43% of the total, 31.16% of the North Carolina, and 54.16% of the out-of-state students were advanced to French 11.

French Club Programs. (Lithoprinted.) Edwards Brothers, Ann Arbor, Michigan. 1937. (In collaboration with PROFESSOR RENÉ HARDRÉ of the Woman's College of the University of North Carolina.)

The High Mortality in College Entrance French: Cause, Cure. *The French Review,* X: 6. May, 1937.

Les Echecs dans les Examens d'Entrée dans les Collèges Américains. *Courrier des Etats Unis,* February 27, 1937.

A. K. KING has published:

Current Practices in the Training of Teachers. *High School Journal,* **20**: 3. March, 1937.

This study was based on an investigation of practices of ninety-one institutions throughout the United States which are engaged in the training of teachers.

PROFESSOR KING has in progress:

A Study of the Social Philosophy of Thomas Paine.

ROBEN J. MAASKE has published:

The Status of the Elementary School Principal in Oregon. Salem, Oregon: State Department of Education. 72pp. September, 1936.

In this study basic information upon the following phases of the work of an elementary school principal was assembled and critically analyzed and interpreted: (1) general training, (2) professional experience, (3) administrative function, (4) supervisory function, (5) teaching function, (6) clerical function, (7) community relations function, (8) distribution of the time of the principal, (9) professional improvement, and (10) suggestions of principals for improvement. Resulting from the critical analysis and interpretation of the needs of principals, a definite two-year program designed to improve the professional status of the elementary school principal was projected in the study.

PROFESSOR MAASKE has in progress:

Factors in the Prognosis of Scholastic Success in the University of Minnesota School of Business Administration.

An evaluation is being made in this study of various predictive variables available for students entering the School of Business Administration to determine their possible uses in a definite program of student counselling and selection. Variables include scores on a battery of entrance tests over a three-year period, pre-business honor point ratio, high school average and others. The statistical technique of Analysis of Variance is being employed to determine whether the groups entering the School of Business Administration in the years 1934-1935, 1935-1936, and 1936-1937 can be considered a statistically significant, homogeneous group in ability. If so, the combined group will be used for predictive purposes, using certain criteria advanced for determining scholastic success.

The following master's theses were accepted during the year by the Department:

NENA DEBERRY. Study of the Reading Difficulties of a Group of Defective Readers. (Under the direction of MARION R. TRABUE.)

The problem attempted in this study was to determine, through the use of standardized diagnostic reading tests and other more informal tests, and through personal observation and study of the children, the nature and extent of the reading deficiencies of forty-five defective readers in grades two through six, and to attempt to determine the chief causes and distinguishing characteristics of as many cases as time and resources would permit.

The procedure was as follows: First, a study was made of the children's personal and school histories by visiting their homes, by studying their school records, by holding conferences with the children, and by studying the reading program as planned by the school. Second, a Teacher's Observation-Study Sheet, which included important factors dealing with children's study habits in reading, was prepared and given to the classroom teachers as a guide in observing and listing the habits observed. Third, a diagnosis of the children's reading status was made through the Gates Silent Reading Tests, Form 1, and the Ingram-Clark Diagnostic Reading Tests, Form 2, Part I. Fourth, the vision of the children was tested by the use of the Keystone Opthalmic Telebinocular, with Dr. Emmett A. Betts's basic set of Visual Sensation and Perception Slides, to see to what extent visual deficiency might be causing reading deficiencies. Fifth, the hearing of the children was tested by the use of the Acoumeter to see to what extent defective hearing might be causing retardation in reading.

After studying the children and the data collected, the following tentative conclusions seem to be justified:

It is probable that the reading defects of the majority of the children are due in each case to a combination of causes rather than to any one isolated cause.

It seems probable that deficiency in visual acuity is a highly frequent cause of the reading deficiencies of this group of children. Sixty-nine per cent of the children have visual deficiencies.

It is believed that environmental influences are an important factor impeding the reading of many of these children.

In one school where this study was conducted, two distinct groups of children are represented: one from homes where a rich background of reading experiences are provided, and the other group from quite the opposite type of homes. It is possible that this situation caused personality and emotional conflicts which greatly retarded the reading of some of these children.

JOSEPH EDGAR MORRIS. An Evaluation of Some Extra-curricular Activities in North Carolina High Schools. (Under the direction of ROY W. MORRISON.)

This study was undertaken to determine the extent and general desirability of the program of non-athletic extra-curricular activities officially sponsored by the high schools of North Carolina.

The information presented regarding the program of extra-curricular activities in North Carolina high schools was obtained from the Principal's Annual Report to the State Superintendent of Public Instruction for the school year 1935-1936. Comparative data concerning practices throughout the country were obtained from a previous study of the non-athletic extra-curricular activities sponsored by a cross section of high schools throughout the United States.*

The results of this study indicate that North Carolina high schools are far behind those of the nation in regard to the number of activities sponsored. The larger schools show a greater disparity in this respect than the smaller schools.

In North Carolina high schools only 38.6% of the pupils are, apparently, participating in any extra-curricular activity, whereas 60.9% of the pupils in the schools of the nation appear to take part in some type of extra-curricular activity. This may be partly due to the fact that the schools of North Carolina sponsor such a narrow range of activities that probably the type being carried on does not meet the needs of the majority of the pupils.

---

* Bulletin 1932, No. 17, Monograph No. 26, *Non-Athletic Extra-curricular Activities.* National Survey of Secondary Education, United States Department of the Interior, Office of Education.

NOLLIE WILBOURNE SHELTON. An Investigation of Some of the Common Causes of Interests of Certain Sixth and Seventh Grade Pupils in the Social Studies. (Under the direction of W. J. MCKEE.)

This investigation involved a study of (1) the causes of children's interests in various phases of the social studies, (2) the extent to which they are common to two or more phases of the social studies, and (3) the extent to which they vary with environment, sex, and school grade.

The data consisted of over 2,100 items of interest from (1) questionnaires answered by pupils and teachers, (2) questions asked by pupils, and (3) summaries of reported classroom units in the social studies. These data were analyzed to discover causes of interests rather than concrete interests.

Personal values, actions of pupils, actions of others, and processes appear to be important causes of interest which are common to several phases of the social studies. Identities, effects, development, comparison, sources, and realities appear to be of minor importance as causes of interest and are limited as common factors of interest. Customs, whereabouts, general nature, variations, and quantities seem to be of minor importance as causes of interest, but have value as common factors in several phases of the social studies. "Causes" appear to be a fairly important factor of interest within certain limitations.

Some differences, arranged in their order of importance, were discovered in rural and urban environment, sex, and school grade. These were not sufficiently convincing to warrant any general conclusion.

LEON BAYARD TAYLOR. The Effect of Specific Training in the Skills and Techniques of Reading Problems on Problem-Solving Ability in Elementary Algebra. (Under the direction of R. W. MORRISON.)

Two groups of beginning algebra students were selected that were approximately equal in all the factors that are likely to affect the pupil's ability to learn algebra. For four months the sixty-seven pupils in the experimental group were given specific training in reading problems during the regular class period. No special training was provided for the control group of sixty-eight pupils.

Tests were given at the end of the period with the following results: (1) The experimental group scored almost twice as high in problem solving as the control group; (2) the experimental group scored just as high on algebra computation as the control group.

These results indicate: (1) Training in reading problems has definite value; (2) such training can be given during the regular class period without neglecting other parts of algebra.

DEPARTMENT OF ENGLISH

GEORGE R. COFFMAN is directing the following doctoral dissertations:

MARY ELIASON. The Third Estate in Chaucer, Piers Plowman, and the Towneley Plays.

W. F. MCNEIR. The Place of the Elements of English Romance in the Plays of Robert Greene.

JOHN M. BOOKER has a Kenan research project in progress involving the first unit of a study of certain social, religious, traditional, and critical currents in the literature of the Victorian era.

He is directing the following research:

GERALD G. GRUBB. Charles Dickens: Journalist. (Doctoral dissertation nearing completion.)

FRANCIS P. HULME. The Influence of Dante Gabriel Rossetti on English Poetry. (Progress on doctoral dissertation.)

HERMAN WITTMEYER. The Influence of Joseph Conrad's Philosophy on his Fiction. (Progress on master's thesis.)

G. C. TAYLOR has the following research in progress:

Studies in Shakespeare-Jonson Relations.

PROFESSOR TAYLOR is directing the following doctoral dissertations:

A. D. BEACH LANGSTON. Studies in the Renaissance Books of Consolation.

JAMES KESTER SVENDSEN. Studies in Renaissance Science.

GREGORY L. PAINE has published:

The American Literature section of The American Bibliography for 1936, in the *Publications of the Modern Language Association of America,* LI, 1937 (Supplement).

PROFESSOR PAINE is directing the following doctoral dissertations:

G. H. DAGGETT. Poetic Theory in American Letters from Whitman.

M. L. GRIFFIN. The Relationship of Northern and Southern Writers.

M. J. Hagood. A Study of Literary Nationalism in American Magazines, 1770-1833.

G. F. Horner. A History of American Humor. (Dissertation completed.)

B. G. Lumpkin. Social Groups as Treated by the Writers of Southern Regional Short Stories before 1900.

M. S. Shockley. A History of the Richmond Theatre.

Arthur Palmer Hudson has published:

Folk Tunes from Mississippi. Collected by Arthur Palmer Hudson and edited by George Herzog. New York: Music Research Department, National Play Bureau, Federal Theatre Project, Works Progress Administration, 1937, pp. xxii, 55.

This publication is a supplement to Professor Hudson's *Folksongs of Mississippi and Their Background* (University of North Carolina Press, 1936). It contains forty-six folk tunes collected by him from white people in Mississippi between the years 1923 and 1930. Most of the music and the words to sixteen of the songs are here published for the first time in their Mississippi variants. The publication contains "Notes by the Collector," and "Foreword" and "Notes to the Songs" by the editor of the music, Professor George Herzog, of the Department of Anthropology, Columbia University.

Folksong Report. *South Atlantic Bulletin,* III: 1: 9, 12. April, 1937. A survey of folksong research activities in the south during 1936, prepared by Professor Hudson as chairman of the Folksong Section of the South Atlantic Modern Language Association.

A review of *Southern Folklore Quarterly,* Vol. I. *South Atlantic Bulletin,* III: 1: 9, 10, 11. April, 1937.

A review of Theodore C. Blegen and Martin B. Ruud's *Norwegian Emigrant Songs and Ballads,* Minneapolis: The University of Minnesota Press, 1936. *American Literature,* IX: 267-269. May, 1937.

Professor Hudson is directing the following research:

Karl Pfeiffer. Contemporaneous Critical Opinions of Walter Savage Landor. (For the doctor's degree.)

Charles L. Pittman. Wordsworth and the Scientific Movement. (For the doctor's degree.)

ELEANOR LANE. Byron and the Fine Arts. (For the master's degree.)

A. C. HOWELL is directing the following doctoral dissertation:

EUNICE MACKAYE. Francis Bacon as a Historian.

DOUGALD MACMILLAN has prepared for publication *Drury Lane Calendar, 1747-1776* (in press, Oxford, The Clarendon Press), and a Catalogue of the Larpent Collection of Plays (to be published by The Huntington Library).

He is directing the following doctoral dissertations:

D. A. BROWN. George Crabbe as a Satirist.

G. H. FOSTER. History Plays in England, 1660-1800.

MARY C. RANDOLPH. The Neo-Classic Theory of Satire (in the absence of PROFESSOR BOND).

D. J. RULFS. The Minor Elizabethans on the London Stage During the Romantic Period.

H. W. SAMS. The Background of Bishop Joseph Butler's Idea of Conscience.

L. DELONG WALLACE. Studies in the Text of Buckingham's *The Rehearsal.*

R. M. WALLACE. The Narrative Techniques of Henry Fielding and his Contemporaries.

E. E. ERICSON has published:

Noun Clauses in *Because. Anglia,* **61:** 112-113. 1937.

Hoover and Henri IV. *American Speech,* **12:** 9. 1937.

Ernst C. P. Metzenthin. *Journal of English and Germanic Philology,* **36:** 144. 1937; and *German Quarterly,* **10:** 93-94. 1937. (The same article translated into German by DR. F. E. COENEN appeared in *Zeitschrift für Deutsche Philologie,* **62:** 220-221. 1937.

Bowie Knife. *American Speech,* **12:** 77-79. 1937.

Ward or the Devil. *American Literature,* **9:** 76-77. 1937.

Old-Fashioned Veterinary Terms. *American Speech,* **12:** 160. 1937.

"Reaving the Dead" in the Age of Chivalry. *Modern Language Notes,* **51:** 353-355. 1937.

Textual Criticism of G. T. Flom's *Old English Grammar and Reader. Beiblatt zur Anglia,* **48:** 35-36. 1937.

And how and *und wie. Beiblatt zur Anglia,* **48:** 247-248. 1937.

Morgan T. Callaway, Jr. *Englische Studien,* **71:** 439-440. 1937.

Metaphors for Heaven and Death. *Beiblatt zur Anglia,* **48:** 247-248. 1937.

John Hort and Skipper Ireson. *New England Quarterly,* **10:** 531-532. 1937.

Short Notes in *Notes and Queries* for 1937 (Language and Literature):

A Victory for Grammar, **172:** 260; Soup: Is it Eaten or Drunk? **172:** 172; Author: Whose Sad Face, etc., **172:** 197; Spelling Reform Association, **172:** 212; As Is, **172:** 208; News: Origin of Its Folk Etymology, **172:** 247; Etymology of *Orchard,* **172:** 283; Poetic Similarity, **172:** 319; Everyone: The Claims of Grammar, **172:** 377; John Citizen, **172:** 393; Poems in Praise of Books and Reading, **172:** 412; American Pronunciation, **172:** 413; Erasmus or the Devil: Another Version, **172:** 424; Words Divided at the End of a Line, **172:** 448; *Auctioneer* as a Verb, **172:** 425; Bowie Knife: Early Uses, **172:** 440; A Slang Conglomerate, **173:** 153; Notes on the American Language, **173:** 3.

(With Ervid E. Ericson.) *India in Revolution.* University of North Carolina Library Extension Publications, **3:** 4. 1937.

Professor Ericson has had accepted for publication:

British *eat* and American *ate;* Moron—a Misconception; *Proof*—Its Meaning. *American Speech.*

An Eighteenth Century Lincoln Story. *Journal of the Illinois State Historical Society.*

A Ruskin Allusion. *Englische Studien.*

Bullock sterteth, bucke verteth. *Modern Language Notes.*

PROFESSOR ERICSON has the following research in progress:

A History of the English Language. (This is to be a text-book for use by graduates and advanced undergraduates. Collections covering years of research are to be used in this work.)

A Bibliography of the Writings on Old English Literature. (With KEMP MALONE and STEFAN EINARSSON of the Johns Hopkins University.) This work will include every piece of criticism, translation, or editing that touches Old English literature. It is being done under the auspices of the Rockefeller Foundation for Research in the Humanities.

A Bibliography of Homage Volumes. (With URBAN T. HOLMES.) This will cover all the writings scattered throughout honorary volumes that deal with Indo-European language and culture. Over one hundred such volumes have been examined.

PROFESSOR ERICSON has continued his studies in American dialect. Some of this material has been submitted to the Historical Dictionary of American English being compiled in Chicago under the editorship of SIR WILLIAM CRAIGIE and PROFESSOR M. M. MATTHEWS.

The following theses and dissertations have been undertaken under PROFESSOR ERICSON'S direction:

DEAN ARMOLD. A Glossary of the Anglo-Saxon Prose Romance, "The Apollonius of Tyre," with a Historical Introduction. (Master's thesis completed.)

JOHN WALKER MCCAIN. Certain Aspects of John Heyward's Vocabulary in Relation to His Cultural Interests. (Doctoral dissertation completed.)

MARY ETHEL DICHMANN. Linguistic Interests in the Gentleman's Magazine. (For the master's degree.)

DOROTHY FORD. A Study of Biblical Diction in the Middle English Period. (For the master's degree.)

IDELLE JONES. A Translation of Wulfstan's *Homilies*. (For the master's degree.)

WALTER MOSES. The Language and Style of Thomas Fuller. (For the doctor's degree.)

W. L. WILSON. A Comprehensive Study of North Carolina Dialect. (For the doctor's degree.)

Raymond Adams has published:

Review of Henry Steele Commager's *Theodore Parker. American Literature,* IX: 265-266. 1937.

Review of *Men of Concord and Some Others as Portrayed in the Journal of Henry David Thoreau. American Literature,* IX: 267. 1937.

During the year he has issued in mimeographed form for distribution to scholars, collectors, and university libraries a supplementary annotated catalogue of books in his library:

The Thoreau Library of Raymond Adams, a Catalogue, Supplement. Items 1089 to 1390.

Richmond P. Bond has published:

Eighteenth Century Correspondence: A Survey. *Studies in Philology,* XXXIII: 572-586. 1936.

Robert B. Sharpe is preparing a paper on The Influence of the Admiral's Company as a Producing Organization Upon the Drama, to be read at the annual meeting of the Modern Language Association.

He is directing the following research:

Gilbert Ohlmann. A Critical Edition of Porter's *Two Angry Women of Abingdon.* (Doctoral dissertation.)

Elizabeth Fisher. The Countess of Pembroke and Her Literary Coterie. (Master's thesis.)

Louise M. Morton. Shakespeare's Changing Attitude Towards History and the Chronicles. (Master's thesis.)

Mary Lee Scales. Staging in America, 1840-1870. (Master's thesis, directed jointly with Samuel Selden.)

Claude Seawright. A Study of Massinger's Exposition. (Master's thesis.)

J. O. Bailey read a paper, Scientific Fiction: A Neglected Kind of Victorian Literature, before Section English X: Victorian Literature, at the December, 1936, meeting of the Modern Language Association of America in Richmond, Virginia.

H. K. RUSSELL, with PROFESSOR A. E. ZUCKER and MARY MARGARET RUSSELL, has had accepted for publication a translation of the *Redentin Easter Play* for the series "Records of Civilization" by the Columbia University Press.

WILLIAM WELLS has published, in collaboration with PROFESSORS CRAIG and PATRICK: Recent Literature of the English Renaissance. *Studies in Philology,* XXXIV: 2: 260-382. April, 1937.

He read *The Queen's English* as one of the Tudor Lectures at Stanford University during the past summer.

He is continuing research in bibliography of the English renaissance, and is preparing a study of the writings of John Dee.

The following doctoral dissertations were completed during the year under the direction of the Department:

JAMES EDMUND CONGLETON. The Neo-Classic Theory of Pastoral Poetry in England. (Under the direction of RICHMOND P. BOND.)

The Introduction contains an analysis of the protean pastoral literature between Theocritus and Wordsworth and a definition of its multifarious types, a study (on historical principles) of the terminology of the pastoral, and a survey of modern studies about pastoral poetry.

Part One is a background study of the criticism of pastoral poetry before 1684. The ancient and medieval critics made no comments on the pastoral; yet later critics analogously applied some of Aristotle's and Horace's principles to the pastoral and elevated the editorial notes of some of the scholiasts to a position of critical authority. The Renaissance neo-classic Italian critics, Vida and Scaliger, developed the doctrine of the genres, deified Virgil, and recommended close literary imitation. The sixteenth and seventeenth century French critics reflected the expansive developments modeled after Guarini and Sannazaro. The apogee of neo-classicism in the theory of pastoral poetry was reached in Rapin's erudite "Treatise," 1659. The other item of prime importance in France was Fontenelle's "Discours" in 1688. Disregarding the ancients, he opposed Rapin's ideas and advanced a theory founded on reason. The Renaissance English critics interested in the pastoral were strongly influenced by the humanistic eclogue as developed by Petrarch and Mantuan; therefore, the pastoral poetry in England was vitiated by the allegorical element.

Part Two is an historical account of the theory of pastoral poetry in England between 1684 and 1798. Three schools of critics developed and declined in the three periods between these dates. The neo-classic critics, who dominated the period between 1684 and 1717, were disciples of Rapin. Like him they strove to free the pastoral from the aberrations it had suffered at the hands of Italian and French writers and to restore to the

pastoral the qualities with which it was endowed by the classic pastoral poets. They revered the ancients and looked to them—especially to Aristotle and Horace and to Theocritus and Virgil—for guidance. The most prominent critics in this school were Chetwood, Walsh, and Pope. The rationalistic critics, who dominated the period between 1717 and 1750, were deeply and directly indebted to Fontenelle. Like him they opposed the servile attitude of the neo-classicists. They declared that modern poets should be guided by reason rather than by the ancients and that English pastorals should reflect native rural life. The most prominent writers in this school were Addison, Tickell, and Johnson. The period between 1750 and 1798 was dominated by the Romantic critics. They believed that this genre might prove to be an excellent vessel in which to pour the wine of Romanticism and pointed to Gessner as the successful modern pastoral poet. The most important critics in this group were Blair and Drake.

Part Three presents an analysis of the critical writings on pastoral poetry between 1684 and 1798. Critics often expressed themselves on the following topics: Origin, Purpose, Scene, Characters, Fable, Matter, Language, Form, Verse, Style, and Qualities. Their ideas on these themes indicate the course of the major literary doctrines of the century—neo-classicism, rationalism, and Romanticism.

William John Olive. Burlesque in Elizabethan Drama. (Under the direction of G. C. Taylor.)

This study treats burlesque of literature in Elizabethan drama with attention concentrated upon the period of Shakespeare's dramatic activity. Though the years 1590-1620 are taken as general limits, some attention is given to preceding and following productions.

After a brief introductory consideration of terminology, in which burlesque is defined as the generic term comprising parody, travesty, and other forms of humorous imitation, a preliminary chapter discusses the form of burlesque in the period, with reasons for the development of this form and with indications of its influence upon the form of later dramatic burlesques. The tendency toward the use of the induction and the play within the play as vehicles for burlesque is considered in relation to *The Rehearsal* and its successors. Of the four remaining chapters, two are devoted to the drama excluding Shakespeare and two to Shakespeare primarily. The principle determining the organization throughout is the type of literature burlesqued. Chapter Two is concerned with burlesque in the drama of elements in non-dramatic literature. Chapter Three is devoted to a study of dramatic burlesque of elements in the contemporary drama itself. In the fourth chapter a study is made of the burlesque of Shakespeare's writings in the dramas of his contemporaries, and in the fifth a study of Shakespeare's own burlesque.

The conclusion is reached that burlesque played a definite part in directing literary taste and served as an effective form of literary criticism. The attitude of burlesque dramatists is taken as an indication of the de-

velopment of sophistication and of changes in literary fashions. Refinement of method, attention to niceties of diction, and avoidance of excesses generally result partly from the critical element in contemporary burlesque. The literary excesses chiefly burlesqued are those of the sonneteers, of Euphuism, of Arcadianism and the pastoral conventions, of the romances, and of the Kyd-Marlowe type of tragedy. The plays most frequently burlesqued are *The Spanish Tragedy* and *Tamburlaine*. Relatively few complete dramatic burlesques occur during the period, but there are many instances of burlesque inserted in otherwise serious plays. It is noted that this method of inserted burlesque is typically Elizabethan and that it is often responsible for a dramatic form in which the serious action of a play is burlesqued by parallel comic elements in the same play, even in tragedy, such burlesque often constituting comic relief following moments of high tension. This burlesque of serious elements in the same play is found to be especially characteristic of Shakespeare. The study also makes clear that much burlesque of literature is closely allied to, and often inseparable from, social satire; and that, as such satire especially, the burlesque manner itself often becomes highly conventional.

HUGH THOMAS SWEDENBERG, JR. The Neo-Classic Theory of the Epic in England. (Under the direction of RICHMOND P. BOND.)

The purpose of this study is to survey the critical theory concerning epic in England from 1650 to 1800, to present this theory against a background of Classical, Continental, and English criticism, and to relate it to the philosophical tenets current during the 1650-1800 period. The work is divided into three parts. Part One is a study of background materials, treating specifically the theory of epic as propounded by Greek and Roman, sixteenth-century Italian, seventeenth-century French, and English Renaissance critics. Part Two is an account of the development of English theory from 1650 to 1800. Part Three consists of an analysis of the critical themes most often discussed by theorists of the epic during these years.

The theory of the epic started with Aristotle, who gave poetic laws concerning characters, fable, verisimilitude, unity of action, and unity of time. Horace added several rules, the most influential being that of *in medias res*. These classical theories became very popular in sixteenth-century Italy, where they were considerably expanded. In Italy discussions of the *romanzi*, unity of action, unity of time, the proper time and place for an epic action, Christian machines, and decorum flourished. These same topics were employed by French critics of the seventeenth century, who wrote of them in numerous essays. By the time Le Bossu published his *Traité du poème épique* in 1675, the critical approach to the epic had become definitely set and conventionalized. It was this treatise which had most influence on the English critics of the eighteenth century. Before 1650 little criticism of the epic was written in England, only two topics being discussed frequently. These were didacticism and versification.

The period 1650-1700 saw the inception and a considerable development of English neo-classic theory of the epic. From the publication of the essays of Davenant and Hobbes in 1650 to the death of Dryden in 1700, English criticism developed highly formalized method and materials. Both were derived largely from Classic and Continental critics. The practice of logical criticism of the epic was another manifestation of the reasoned attitude in government, church, and philosophy. Methods and doctrines became fixed, until toward the end of the century Blackmore and Dennis adopted the formal approach of Le Bossu.

The theories and method of the second half of the seventeenth century were employed constantly by the critics of the next fifty years. This period, however, witnessed the beginnings of those doubts which were later to cause complete rejection of the doctrines of neo-classicism. This questioning became apparent particularly in statements about rules and critical authority. Pope, Blackmore, Blackwell, and Fielding are only a few of those who questioned certain established laws of epic criticism.

The last half of the eighteenth century marked a continued attack on neo-classic epic theory, until by 1800 it was practically moribund. Le Bossu was laughed out of favor; the Romantic epics were accepted as great, despite Aristotle's rules; and the novel was frequently given the name of epic. These changes can be accounted for in view of certain intellectual forces which became powerful, especially the renewed interest in the medieval, the theory of primitivism, and the doctrine of progress.

English writers usually criticized epic under the following topics: Definition, Fable and Action, Moral, Unity, Probable and Marvellous, Machines, Characters, and Language and Versification. All these themes were not utilized by every critic, but some of them appeared in almost every treatise on epic, and all of them were used by the most orthodox writers. In Part Three of this study the most pertinent comments on each of these topics are listed, each quotation being given a serial number. A synthesis of the critical opinion on each topic is presented; documentation is made by reference to the serial numbers of the quotations listed.

The following master's theses were completed under the direction of the Department during the year:

MARY ELIZABETH BITTING. Contempt of the World in the Poetry of John Milton: A Study in Milton's Changing Personal and Artistic Emphases. (Under the direction of GEORGE C. TAYLOR.)

Mr. Willard Farnham, in *The Medieval Heritage of Elizabethan Tragedy*, is partly concerned with the conflict between Contempt of the World and Espousal of Life in literature. The general impression of his convictions is the gradual decline of Contempt before the developing Renaissance Espousal and the subsequent overpowering of the former by its sweeping new opposite. It is my belief that the poetry of Milton forms a panorama of supporting evidence revealing a career-long struggle between Espousal

and Contempt, which exceeds that experienced by the ages of which Petrarch, Boccaccio, Chaucer, and the Elizabethan drama are literary examples. The importance of that struggle in Milton (and its final outcome, the triumph of Contempt) lies in its connection with the development of the doctrines constituting the philosophy of his poetry. Interest in the issue is intensified by the location of Milton at the height of that Renaissance which, supposedly, adopted Espousal.

ELROY DUPUIS. A Comparison of Certain Aspects of Revolutionary Thought as Found in the Writings of Thomas Paine and Jean-Jacques Rousseau. (Under the direction of GREGORY L. PAINE.)

In the revolutionary ferment of the late eighteenth century, America and France played complementary rôles, for intellectual and physical curiosity kept the two countries closely associated in liberal thought and enterprise. The writings of Thomas Paine and of Jean-Jacques Rousseau were products of this period of unrest which led inevitably to the American and French Revolutions.

The purpose of this thesis is to present certain similarities in the political thought of Paine and Rousseau, and to show the fundamental community of spirit denoted by their congruent views of man's duty and destiny. This study may help to explain the extent to which Paine's writings are not so much provincial as cosmopolitan, and the extent to which a knowledge of Rousseau's thought is necessary to give the perspective without which we may miss in Paine what is truly central.

MANNING HAWTHORNE. The Youth of Hawthorne. (Under the direction of GREGORY L. PAINE.)

The first American ancestors of Nathaniel Hawthorne had been high in the councils of colonial Massachusetts, but their sons and grandsons had turned to the land and to the sea. The social position of the family in Salem had deteriorated.

The death of Hawthorne's sea-captain father, when the boy was four, resulted in his being brought up by his Manning uncles and aunts, as well as by his mother. His relations with his mother were unusually close. The stories of her withdrawal from any social contacts seem to have been exaggerated. His childhood letters, most of them hitherto unpublished, disprove her so-called lack of interest in her children and in life around her.

A tendency to introspection and a life too absorbed by books was broken by the family's removal to Raymond, Maine, where young Hawthorne lived a healthful, outdoor life. While it seems improbable that he was the author of the diary purported to be his, its contents give a good picture of his life in Maine.

After spending a few years in Salem, where he prepared for college and embarked upon a brief journalistic career with his younger sister, Louisa, Hawthorne entered Bowdoin in 1821. His college years were normal and

fairly happy, with some escapades, a few more fines for lack of interest in his classes and duties than were usual among the students, and a normal comradeship with his fellows. He graduated in 1825, with the more or less decided idea of becoming a writer. In this he had been encouraged by Horatio Bridge, his classmate and closest friend.

Mary Stuart Mills. Imagery in Chaucer and Dryden: A Comparative Study of the Imagery in Chaucer's "Knight's Tale," "Wife of Bath's Tale," and "Nun's Priest's Tale," and in Dryden's Versions of Those Stories. (Under the direction of G. R. Coffman.)

Dryden's *Fables* (1700) greatly influenced the revival of Chaucer's reputation. To indicate the differences between Chaucer's and Dryden's versions, I have compared the two, selecting imagery—a stylistic element most nearly representative of all phases of divergence—as a basis for the comparison. An examination of Chaucer's imagery, a survey of theories of translation in the seventeenth century, and a comparison of Chaucer's imagery with Dryden's have led to these conclusions: first, that Dryden's imagery covers a greater range of subject-matter than Chaucer's does, and tends to be more detailed and extended; second, that Chaucer's images are more unified in detail, easier of application to their situation, and apparently called forth by situations which needed imagistic expression and description. Because of those characteristics, Chaucer's imagery is more admired today than is Dryden's, which was intended as ornament to a style no longer so highly esteemed as in the seventeenth century.

Charles Albert Petigru Moore. Cosmological Ideas in the Poetry of Edmund Spenser. (Under the direction of George Coffin Taylor.)

Recent studies in Spenser's philosophical poetry deal particularly with (1) the sources of his ideas; (2) generally with certain aspects of his cosmic philosophy as they influenced other writers; and (3) interpretations of certain passages long disputed as to meaning. The purpose of this study is to isolate and classify Spenser's widely dispersed cosmological ideas in the most significant passages of his poetry. The Introduction discusses some of the important philosophical ideas current during the Renaissance and explains why Spenser was chosen as representative of his age. Chapter I sets up an outline that will accommodate the cosmic conceptions of any writer thus interested. Chapter II takes up separately each thematic idea classified in the outline and runs it through Spenser's poetry, interpreting the varying passages where necessary and citing critical interpretation when the meaning is doubtful. Chapter III deals with the findings of this study and their comparative significance in the poet's philosophical ideas.

Winnie Alice Murphy. The Literary Relations of Poe with Bryant, Hawthorne, and Lowell. (Under the direction of Gregory L. Paine.)

The purpose of this thesis is to make an estimate of Poe's status and value as a critic through a careful examination of one body of his critiques. Since the largest bulk of his criticism treats of the New England writers, and since it is in these reviews that the largest number of names still important in American literature appears, it is logical to judge Poe's ability as a critic by what he has to say of representative members of this group. The three representatives are Bryant as poet, Hawthorne as tale writer, and Lowell as literary critic. These particular writers were chosen partly because of the fact that Poe is sympathetic in his treatment of them; partly because of the type of literature each one wrote; but mostly because of the fact that some of Poe's finest critical writing has come to us through the reviews of the works of these three men.

DURANT WAITE ROBERTSON, JR. A Preliminary Survey of the Controversy Over Aristotle's Doctrine of Tragic Catharsis. (Under the direction of GEORGE R. COFFMAN and H. K. RUSSELL.)

This study is a record of the principal interpretations of the last clause in Aristotle's definition of tragedy from Aristotle's time to 1935. It is a preliminary survey, the purpose of which is to record only a select group of interpretations in such a manner as to reveal the inception of any given widely-accepted theory of catharsis, and the persistence of the traditions thus generated. The lack of any definitive interpretation at the present day is pointed out, and it is suggested that a more thorough survey of the controversy as it mirrors shifting cultural tendencies would be profitable.

NORMA VIRGINIA ROSE. Milton's Nature Images: A Study of Their Sources, Their Uses, and Their Characteristic Qualities. (Under the direction of GEORGE C. TAYLOR.)

Conclusions arising from the survey substantiate the thesis that Milton was a poet whose knowledge of nature was derived primarily from secondary sources; they establish the fact that his artistic technique lay in his ability to adapt the old to the new; they present a graphic representation of the development of his poetic genius, and they reveal something of the man and his philosophical tendencies.

JAMES ERNEST THORPE, JR. John Keats as a Literary Critic. (Under the direction of ARTHUR PALMER HUDSON.)

This study is based, for primary sources, chiefly upon Keats's letters and poetry. It is divided into chapters treating Keats's literary associations, his groping toward standards, and his personal judgments. The shaping of Keats's natural endowments for the exercise of literary criticism came chiefly from constant association with literary men and books. Few of those books, however, contain literary criticism. His critical and poetical theories concern primarily his conception of the proper attributes of the poet and of poetry. His personal judgments, made in accordance

with these theories, represent the flowering of his criticism. The majority of his judgments are brief, pungent, and vital expressions of his personal reactions; but sometimes they are the sustained utterances of the interpretative or the appreciative critic. Practically all of his criticism represents his personal reactions to pieces of literature. Not a professional or formal critic, Keats is, within his limits, one of the most revealing and stimulating commentators upon the practice, the ideals, and the possibilities of poetic art.

SCHOOL OF ENGINEERING

T. F. HICKERSON has completed a treatment of typical structural members with variable moment of inertia, namely: symmetrical members with straight haunches, those with full parabolic haunches, those with uniformly varying depth, and those tapering in two directions. Formulas for the so-called beam and load properties of such members were derived and thoroughly verified by calculus processes. This procedure involved among other things the determination of the areas and centroids under the $\frac{M}{EI}$-curves applied to the unit members when subjected to (1) end moments alone, and (2) transverse loads alone, the loading system being either concentrated in any position or uniformly distributed.

T. F. HICKERSON presented a paper entitled A Modern Course in Highways at the meeting of the Society for the Promotion of Engineering Education held jointly by the Massachusetts Institute of Technology and Harvard University at Cambridge, Mass., in June, 1936.

T. F. HICKERSON and RALPH M. TRIMBLE prepared all the review questions and problems (115 in number) for Bruce's *Highway Design and Construction,* recently published by the International Textbook Co., Scranton, Pa.

PROFESSOR HICKERSON directed the following research:

WILLIAM LUTHER BLANKENBURG. An Investigation of a Rigid Frame Bridge of Variable Moment of Inertia. (For the master's degree.)

A comparative study has been made of the corner and the crown moments of a rigid frame bridge as determined by various methods of analysis. The bridge is of the type sponsored by Arthur G. Hayden and the Westchester County Park Commission. The analyses include: analysis as a rigid frame bridge using fixation factors and neglecting deck

curvature; analysis as a two-hinged arch; and analysis with a Beggs Deformeter model. The results were also compared with those determined by the Hardy Cross method.

Influence lines were used wherever possible, and the advantages of using them, as well as the advantages and the disadvantages of the different methods of analysis, are set forth. Influence lines are an aid in determining the loading combinations. The analysis as a rigid frame is quite direct and to the point for a preliminary analysis, but it becomes a bit cumbersome using the effect of reinforcing steel. The analysis as a two-hinged arch is quite exact, and it can conveniently include the effect of the steel. It is a rather long analysis, though. As far as models go, they are useful as a check, and they have the advantage of including the effect of brackets, fillets, and gusset plates and excluding the effect of any assumptions.

F. F. GROSECLOSE has the following research in progress:

A Digest of Flexible Couplings for Power Transmission.

An Index of Publications from the Engineering School of the University of North Carolina at Chapel Hill.

DEPARTMENT OF GEOLOGY

WILLIAM F. PROUTY has in preparation:

Silurian Deposits of Eastern Tennessee.

This is to be a part of a monograph on the Silurian of North America to be published by the National Research Council.

Further Evidence as to the Origin of the "Carolina Bays."

He is continuing, with a number of assistants, his studies on the origin of the Carolina Bays through extensive field work in North and South Carolina and by both geological and geophysical methods. This work is financed chiefly by a grant from the Geological Society of America.

PROFESSOR PROUTY is supervising the following research:

WILSON LAIRD. Structure and Stratigraphy of a Portion of the Harrisburg Quadrangle, Pennsylvania.

WILLIAM A. WHITE. Study of Desert Sands.

(With L. D. BURLING.) H. W. STRALEY, III. A Geomagnetic Map of Giles County, Virginia, and its Interpretation in Terms of Geologic Structure.

L. D. BURLING is continuing the field and bibliographic investigation of group phenomena which was undertaken when his paleontologic work was interrupted by tropical exploration.

He is also continuing the successful interpretation of underground structures by means of an instrument which involves a new departure in geophysical research. Improvement in this instrument is now his principal objective.

JOHN W. HUDDLE (with GERALD R. MACCARTHY) has completed for publication a paper entitled Shape Sorting of Sand Grains by Wind Action. This paper was read before the annual meeting of the North Carolina Academy of Science in 1937. It has been accepted for publication by *The American Journal of Science.*

Experimental evidence is presented to show that the superior roundness of dune sands is due largely to a selective action of the wind. Movement under the influence of wind does not seem to be one of rolling, but rather of jumping (saltation). The individual leaps of the rounder grains carry such grains farther than those of angular ones.

PROFESSOR HUDDLE has the following studies in progress:

Description of the Chattanooga Shale Conodonts.

A Study of the Micro-structure of the Order Conodonta.

Description of the Pleistocene Foraminifera of North and South Carolina.

He is supervising the following research:

R. A. EDWARDS. Cenozoic Ostracods of North and South Carolina.

FRANKLIN C. ERICKSON has completed for publication a paper entitled Transhumance in Switzerland. (Accepted by *Economic Geography* for publication.)

This article shows how the physical conditions existing in the mountains of Switzerland have imposed upon the people a semi-nomadic life.

PROFESSOR ERICKSON has the following studies in progress:

A paper on the Land Utilization of Miller's Cove, Tennessee.

Map drawings for a forthcoming text-book on Political Geography.

SAMUEL T. EMORY has completed:

Ninety-fifth Street, a study in Urban Geography.

(Accepted as the field problem required of candidates for Ph.D. degree in Geography at the University of Chicago.)

PROFESSOR EMORY has the following studies in progress:

A Geographic Interpretation of Bright Tobacco Production in North Carolina. (To be submitted as a doctoral dissertation to the Department of Geography at the University of Chicago.)

WILLIAM H. IRWIN has completed for publication a study dealing with The Geology of the Rock Foundation of Grand Coulee Dam, Washington.

PROFESSOR IRWIN has the following studies in progress:

Investigation of the Structure and Petrology of the Columbia River Basalts in the Vicinity of the Grand Coulee.

Survey of the Tectonic History of Northeastern Washington, Northern Idaho, and Northwestern Montana.

H. W. STRALEY, III, has published the following:

Mineral Resources of the World. *Economic Geography,* **13:** 67. 1937.

Tracing a Basic Dike Near Chapel Hill, N. C., by Geoelectric and Geomagnetic Methods. *Contribution 106,* American Institute of Mining and Metallurgical Engineers, February, 1937. (With W. R. JOHNSON, JR., G. R. MACCARTHY, and J. C. MCCAMPBELL.)

Magnetic Anomalies near Wilmington, N. C. *Science,* **85:** 362. 1937.

MR. STRALEY has the following studies in progress:

A Geomagnetic Map of Giles County, Virginia.

A Geomagnetic Reconnaissance in the Southern Appalachian Mountains.

Geomagnetic and Geoelectric Studies of a Pegnatite Dike. (With W. R. JOHNSON, JR.)

The following master's theses have been accepted by the Department during the year:

ESTHER GREENE. Some Upper Cretaceous Foraminifera of North Carolina. (Under the direction of JOHN W. HUDDLE.)

This paper describes fifty species of foraminifera from the Black Creek and Pee Dee formations of the Upper Cretaceous of North Carolina. Families Spirillinidæ, Ataxophragmiidæ, Nodosariidæ, Polymorphinidæ, Rotaliidæ, Acervulinidæ, Orbulinidæ, Heterohelicidæ, Buliminidæ and Uvigerinidæ are represented.

A study of the foraminifera confirms earlier correlations made by means of mega-fossils.

The diagnostic species for the Snow Hill member of the Black Creek is Epistomina elegans d'Orbigny; for the lower part of the Pee Dee, Clavulina insignis Plummer; for the upper part of the Pee Dee, Turrilina cretacea (Cushman).

ROSS WRIGHT HORNBECK. Topographic and Geological Mapping of a Part of the Morgan Creek Basin. (Under the direction of W. F. PROUTY.)

A topographic and geologic map was prepared of a part of the Morgan Creek Basin. Petrologically, the area consists of a great volcano-sedimentary series of rocks, slate-like in character, within which are strips and lenses of conglomerate. A rock of felsitic nature lies adjacent to the slate. Beneath the felsite is a rhyolite associated with the Chapel Hill granite. Diabase dikes cut all of these formations. The slate was found to have been deposited in a basin of some depth, and its character denotes that the source of the material was nearby. After the consolidation of the detritus, the rocks were folded and sheared by forces produced by the intrusion of the Chapel Hill stock. Infiltration of silica carried by the granite magma silicified the slates into a flint-like rock. Because the quartz veins, which were offshoots of the granite, follow the major joint planes, it is assumed that the secondary jointing was induced by other forces.

PHILIP MALLORY LEBARON. The White Belt of the Portis Gold Mine Property, Franklin County, North Carolina. (Under the direction of W. F. PROUTY.)

A study was made to determine (1) the nature of the White Belt, (2) its structural and (3) geological relationships, (4) its areal extent on the Property, and (5) its mineralization. It was found that the White Belt occurred in dikes and sills, was an aplite altered by greisening, and that the mineralization was caused by sulphide-bearing hydrothermal solutions. Geologic and petrographic methods were employed in obtaining these conclusions.

JOE HENRY WATKINS. Origin of the Phosphates of South Carolina. (Under the direction of WILLIAM F. PROUTY.)

This thesis presents evidence to show that the source of phosphorus contained in the phosphate fields of South Carolina was the phosphorus contained in the metamorphic rocks of the Piedmont, which was dissolved by carbonic acid, transported by the streams, and deposited in the highly calcareous marl formation in the Charleston Basin.

The laboratory experiments show that the mineral apatite is soluble in water containing carbonic acid. When the resulting solution was passed through a marl filter, the soluble phosphate was deposited as nodular phosphates, which resembled closely the natural phosphates. The shells contained in the marl were dissolved by the solution and the phosphatized moulds and casts were left in the nodular phosphates. Bones and teeth were not dissolved by the solution but were left in the phosphate.

Analyses of the rocks of the Piedmont show the presence of phosphorus in sufficient quantity to supply the phosphorus contained in the phosphate fields of South Carolina. Field observation showed that the five phosphate fields are located in the Charleston Basin which receives the water from streams whose headwaters are in the Piedmont.

DEPARTMENT OF GERMAN

RICHARD JENTE has the following research in progress, nearly completed:

Proverbia Communia. The Earliest Collection of Germanic Proverbs (Fifteenth Century), edited with Commentary. This work will cover from 450 to 500 printed pages.

GEORGE S. LANE has published:

Celtic Notes (III), *Language,* Journal of the Linguistic Society of America, XIII: 21-28. 1937.

PROFESSOR LANE has the following research in progress:

A Comparative Grammar of the Germanic Languages.

Collaboration on a Dictionary of Indo-European Synonyms, under the direction of PROFESSOR C. D. BUCK of the University of Chicago.

In the past year WERNER P. FRIEDERICH has published the following:

Literary Backgrounds of Present-Day Germany. Chapel Hill: University of North Carolina Press. 1937. (In collaboration with A. E. ZUCKER, now of Indiana University.)

German and French Dramatic Topics of the Seventeenth Century. *Studies in Philology,* September, 1937.

Jakob von Graviseth's Heutelia. *Publications of the Modern Language Association of America,* December, 1937.

A book review of Herbert Cysarz' *Deutsches Barock in der Lyrik. Germanic Review,* July, 1937.

PROFESSOR FRIEDERICH is still engaged in work concerning the literary influences between England, France, Germany, and Switzerland during the eighteenth century, and he has also begun to investigate the German influences upon such American authors as Irving, Poe, and Longfellow.

F. E. COENEN has published:

Wilhelm Raabe's Treatment of the Emigrant. *Studies in Philology,* XXXIV: 612-626. 1937.

He has the following research in progress:

Various phases of Theodor Storm's literary art are being examined throughout his *Novellen:* duality and discord in the North-German character as revealed in Storm's works; the longing for solitude as a North-German trait of character in Storm's writings; reminiscence and longing for the past as a characteristic North-German trait; mystic Nordic semi-darkness in Storm's writings; the treatment of clairvoyance; of death; the forms of expression (pantomime, gestures, etc.) of the Nordic people, with emphasis on the women-characters; the treatment of elements in Storm's writings not pertaining to his North-German home-surroundings proper.

The following master's thesis was accepted by the Department during the year:

JAMES FILMORE COOK. A Diplomatic Edition and Translation of a Moravian Travel Diary of the Year 1750 by Michael Singer. (Under the direction of A. E. ZUCKER.)

The purpose of this thesis is to make public a German document of historical interest found in the Archives of the Moravian Church in Winston-Salem, N. C. The first two chapters contain introductory material. Chapter one presents a brief survey of the origin and continuation of the Moravian Church and particularly its revival under the leadership of Count von Zinzendorf during the second quarter of the eighteenth century. Here the significance of the diary is also indicated. Chapter two is a survey of the life of Michael Singer. Chapter three is composed of the transcription and translation of the diary and is followed by an appendix.

DEPARTMENT OF HISTORY

A. R. NEWSOME has published:

The Status of Archival Administration in the American States. *Public Documents,* 1936. (American Library Association), pp. 187-199. This paper was read before the American Library Association at Richmond, Va., May 13, 1936.

LOREN C. MACKINNEY has published:

Early Medieval Medicine. Baltimore: Johns Hopkins University Press. 1937.

PROFESSOR MACKINNEY'S *History of Medieval Civilization* will be published by Farrar and Rinehart early in 1938, as the second volume of a series of histories of civilization.

With the assistance of MISS FRANCES HARPER he is preparing *The Correspondence of Bishop Fulbert of Chartres* for publication as a volume of the Columbia University "Records of Civilization" series.

He has prepared from manuscript sources a study concerning Medieval Medical Dictionaries and Lexicons, which will appear as a chapter in *Anniversary Essays in Honor of James Westfall Thompson* (now in process of publication, the University of Chicago Press).

PROFESSOR MACKINNEY was the Noguchi Lecturer at the Johns Hopkins Institute of the History of Medicine in December, 1936. He delivered three lectures concerning The Dark Age of Medicine in France. The lectures were in part the outcome of researches conducted in the manuscript collections of Europe during the winter, spring, and summer of 1936, while on a Kenan leave of absence.

He has been invited to read a paper on the history of medicine in the Middle Ages at the International Congress of Historical Sciences, to be held in Zurich, Switzerland, in the summer of 1938. His subject will be Medical Service in French Hospices of the Middle Ages.

HUGH T. LEFLER has written The History of North Carolina for the American Guide Book Series (to be published in the spring of 1938.)

He has in progress a study of the Society for the Propagation of the Gospel in the American Colonies, and he has in preparation a college text-book on the Social and Economic History of the United States.

Fletcher M. Green has published:

Walter Lynwood Fleming: Historian of Reconstruction. *Journal of Southern History,* II: 497-521. November, 1936.

Gold Mining: A Forgotten Industry of Ante-Bellum North Carolina. *North Carolina Historical Review,* XIV: 1-19, 135-155. January-April, 1937.

Gold Mining in Ante-Bellum Virginia. *Virginia Magazine of History and Biography,* XLV: 227-235. July, 1937.

He is directing the following graduate studies:

The Negro in Mississippi Since the Civil War. Vernon L. Wharton.

Georgia Under the Bourbons, 1870-1890. Judson C. Ward, Jr.

The South Carolina Convention of 1867. Solomon Breibart.

Two Florida Plantations. Katharine Chatham.

Howard K. Beale has published:

Propaganda Influences Within the School, in *Education Against Propaganda,* edited by Elmer Ellis. The volume is the *Seventh Yearbook* of the National Council for the Social Studies, published in 1937.

Educational Freedom and Democracy. *Independent Woman,* XV: 347-348, 360-361. November, 1936.

Professor Beale has in press:

A History of Freedom in Teaching in American Schools, Charles Scribner's Sons, to appear in 1938 as one volume of the report of the Commission on Social Studies in the Schools of the American Historical Association.

America Must Save Democracy, to appear in the *Classmate* and the *Epworth Highroad,* published by the Methodist School Publications.

The Recent Status of Freedom in the Schools, to appear as Chapter II of *Educational Freedom in the American School System,* which is the title of the *Second Yearbook* of the John Dewey Society, edited by Gordon Hullfish.

The Historical Background of Educational Freedom, to appear as Chapter III of *Educational Freedom in the American School System.*

PROFESSOR BEALE has in preparation:

Freedom of the School Teacher, to appear as Chapter XIII of *Studies in Freedom of Enquiry,* edited by Edward P. Cheyney, under the auspices of the Social Science Research Council.

Theodore Roosevelt, A Biography, to appear as one volume of the *American Political Leaders Series,* edited by Allan Nevins of Columbia University and published by Dodd, Mead and Company.

JOSIAH C. RUSSELL has published:

Dictionary of Writers of Thirteenth Century England. London: Longmans, Green and Co., Special Supplement No. 3, *Bulletin of the Institute of Historical Research.* Supplements to this *Dictionary* will be published in the *Bulletin* in even-numbered years. Social Status at the Court of King John. *Speculum,* XII: 319-329. 1937. Medieval Population. *Social Forces,* XV: 503-511. 1937.

PROFESSOR RUSSELL has had accepted for publication:

Early Parliamentary Organization. *American Historical Review.*

Length of Life in England, 1250-1348. *Human Biology.*

Chroniclers of Medieval Spain. *Hispanic Review.*

He has in preparation:

Editions of the chronicles attributed to Peter of Ickham and (with J. P. HEIRONIMUS) of the poems of Matthew of Rievaulx.

Studies of the life and architecture of Elias of Derham (with H. L. HONEYMAN), of the origins of English university life, and of medieval population.

He is directing the following research:

E. A. HAMMOND. The Medical Profession in Thirteenth Century England. (Progress on master's thesis.)

Cecil Johnson has published:

The New Unified Social Studies Course, University of North Carolina. *Proceedings,* Sixteenth Annual Meeting of The North Carolina College Conference. 1936. This paper was read at The North Carolina College Conference, Greensboro, N. C., November 6, 1936.

Professor Johnson has in preparation a monograph on British West Florida.

He is investigating the files of *The South Carolina Gazette* (Charleston Library Society) for material on Pre-Revolutionary Charleston.

J. Carlyle Sitterson has published:

Ante-bellum Sugar Culture in the South Atlantic States. *Journal of Southern History,* May, 1937.

Mr. Sitterson has completed an article on Magnolia Plantation, 1852-1862, a decade of a Louisiana Sugar Estate.

The following doctoral dissertations were completed under the direction of the Department during the year:

Charles Edward Cauthen. Secession and Civil War in South Carolina. Part I. Political. (Under the direction of Fletcher M. Green.)

A definite reaction from the extreme secession sentiments of 1850-1851 occurred in South Carolina during the half-dozen years before 1860. A moderate group favored coöperation with the National Democratic party for the protection of southern interests within the Union. Though bitterly opposed, this group was definitely in the ascendance until its leadership was given a rude shock by the John Brown raid. Factional conflict continued in 1860, but the prospect of Lincoln's election rapidly united the state on a resistance program. Successful efforts were made to avoid a division on the old question of coöperative or separate state secession until assurance was obtained that other cotton states would follow South Carolina out of the Union. State leaders frankly advanced the necessity of protecting slavery as the motive for secession and skillfully united the state on this issue. Secession silenced the voices of the few Unionists.

Having resumed national sovereignty, South Carolina led the movement for a Southern Confederacy and greatly influenced the formation of the Confederate Constitution, although she objected strenuously to some of its features. In her relations with the United States and the Confederate government in regard to the forts in Charleston harbor, the state assumed an uncompromising attitude until evacuation by the United States was finally effected.

South Carolina had not expected secession to result in war, but entered confidently upon it and contributed largely to the first southern forces in Virginia. Her reluctance to send troops in late 1861 was due to the expectation of the attack on her own coast, which materialized November 7. Panic following the fall of Port Royal and general lack of confidence in the ability of Governor Pickens led to the creation of an executive council which absorbed the governorship in early 1862. The council performed its duties with conspicuous success, but it became the source of the greatest political quarrel in the Civil War history of the state and was discontinued in late 1862.

In general, both the people and the state government exhibited great loyalty to the Confederate cause. Some, however, placed personal gain above the general welfare. Many protested against impressments. Others, especially in the northwestern part of the state, were led by suffering and defeatism into actual disloyalty. But a peace movement in 1864 reached only small proportions, and the masses remained loyal even after the hope of victory became desperate. Few of the state governments coöperated more fully with the Confederacy than did that of South Carolina. Though questioning the constitutionality of conscription she gave to it her unprotesting support. Insisting at times on her right to exempt certain classes, especially overseers, her policy in regard to exemptions was, until the last few months of the war, one of comparative liberality.

Confidence in the Davis administration was early undermined, but the carping criticism of the MERCURY was at first generally deprecated. The reaction against President Davis developed rapidly after the defeats of early 1862, and reached its culmination in the legislature of 1864, which elected an extreme state rights governor, A. G. Magrath, and passed laws which clashed with Confederate policy in regard to exemptions and the impressment of Negroes. Governor Magrath vigorously asserted the rights of the state, and in early 1865 proposed a league of the Carolinas and Georgia for concerted action, not only for defense but also for a demand on President Davis for military and political reform. Before any action could be taken the Confederacy collapsed and Federal troops assumed control in South Carolina.

JOSEPH CARLYLE SITTERSON. The Secession Movement in North Carolina, 1847-1861. (Under the direction of A. R. NEWSOME.)

North Carolina was soon drawn into the secession movement that developed in the south after the introduction in Congress in 1846 of the Wilmot Proviso. North Carolina did not, however, seriously consider actual secession in 1850-1851 as did some of the states of the lower south. During the fifties the operation of social, political, and economic factors created a significant Southern Rights sentiment. The geographic and economic sectionalism within the state, however, together with the large number of non-slaveholders, hindered the development of a strong ultra-southern party in North Carolina. Nevertheless, the course of events

from 1847 to 1859 convinced many of the political leaders in the state that the rights of the south were not safe in the Union. John Brown's raid in 1859 and the election of Lincoln in 1860 aroused in the minds of thousands of North Carolinians apprehension for the safety of southern institutions.

Between the election of Lincoln, November, 1860, and the secession of the state, May, 1861, North Carolina was the scene of an exciting contest between those who believed that the best interests of the state demanded that she withdraw from the Union and those who believed that North Carolina could maintain her rights and interests within the Union. An attempt to call a convention in February, 1861, failed. The failure of all efforts at compromise, the attack on Fort Sumter, Lincoln's call for troops, and the secession of Virginia crushed Union sentiment in the state and forced North Carolina to withdraw from the Union.

Throughout the study an effort has been made to estimate the social, political, and economic factors which produced secession sentiment, to ascertain the areas and groups from which this sentiment derived its greatest strength, and finally to describe the events which were ultimately responsible for the secession of North Carolina.

John Harold Wolfe. Jeffersonian Democracy in South Carolina. (Under the direction of J. G. de R. Hamilton.)

Jeffersonian democracy in South Carolina gained its immediate impulse from the conditions existing during the Revolutionary epoch and the plastic years of the new nation. The state's physiography and culture outlined its form. Influenced by developments in Europe and America and by their own interests and inclinations, the people of South Carolina went far toward laying the foundation of a democratic social structure.

South Carolinians enthusiastically hailed the outbreak of the French Revolution, formed patriotic organizations sympathetic to its prosecution, warmly welcomed Citizen Genêt, vigorously opposed the Jay Treaty, and looked askance at things British. Even when the United States was on the verge of war with France, many apologized for her reckless conduct. Forced to choose, however, between their own nation and their European favorite, they loyally supported defensive measures. The crisis over, they concentrated their efforts on terminating the slight rise in Federalist popularity which had accompanied the expectancy of war.

While the Federalists controlled the general government, the more vocal members of the South Carolina delegations in Congress were Federalists, but from the First Congress a majority showed inclinations toward what was later called Jeffersonianism. No Federalist candidate for President, except Washington, ever received an electoral vote from South Carolina. In 1796 Jefferson was the first choice of every elector. The election of 1800, though very bitterly fought, showed clearly that the Federalist revival in 1798 was only temporary. By 1805 every member of the state's Congressional delegation was Republican.

During Jefferson's second administration the party loyalty of South Carolina was severely tested. The Embargo and other measures of economic coercion fell hard upon a section so dependent upon foreign trade relations, but commercial restrictions were preferred to war. By 1810, however, the younger and more vigorous Republicans had become dissatisfied with peaceful efforts. The conflict which they helped precipitate with England was popular in South Carolina.

During the war period most of the state's leaders leaned toward nationalistic policies. This, however, was later seen to have been only a temporary tendency, motivated by abnormal conditions and impatient young leadership. Before long, local conditions and external developments caused a return to the earlier doctrines of Jeffersonian Republicanism instead of an evolution toward new and more democratic ideals.

Within South Carolina the moving of the state capitol to a more central location, the granting of a more equitable basis of representation, the establishment of manhood suffrage, the setting up of South Carolina College, and the taking of the first steps toward creating a public school system, along with other measures, might well have furnished the framework for a growing, vigorous democratic social structure. But this structure was never completed. Emerging social and economic forces prevented the Jeffersonian ideals from continuing their normal and progressive evolution. Their growth was checked at least for the time in South Carolina, but their vitality, even today, still leads men to struggle for their maturity.

COMER VANN WOODWARD. The Political and Literary Career of Thomas E. Watson. (Under the direction of HOWARD K. BEALE.)

Partly biography and partly political history, this study is an attempt to present in its proper perspective and *milieu* the career of Thomas Edward Watson (1856-1922) of Georgia. It was found that though Watson was born into the planter class, and later regained that status, his formative years were spent in a poverty which identified his sympathies with the small farmer class. A rebel and fighter by temperament, he was made hostile by circumstance to the new capitalist order in the south and early assumed the rôle of agrarian avenger.

His first political stand was taken in 1880 as a young leader of the revolt against the Democratic machine in Georgia which was dominated by capitalist-industrialists. Mistrustful of Henry W. Grady's message of industrialism and political alliance with the capitalist east, Watson remained a suspicious spectator during the bustling eighties. Toward the end of the decade, however, he championed the cause of the Farmers' Alliance and in 1890 was elected to Congress. There he was the first, and for a time the only, southern Congressman to join the new People's party, of which he was the official leader in the House. He was also recognized as chief of the third party in Georgia, and as a leading national advocate of an alliance between agrarian west and south in the new party. In the

elections of 1892 and 1894 he was defeated for reëlection by the Democrats, who revived the fraudulent methods of Reconstruction days. His unrelenting fight against odds won the admiration of Populists everywhere. In 1896 he was nominated Vice-Presidential candidate by the Populists before Bryan was chosen to head the ticket. Although an outstanding opponent of fusion with either old party, Watson accepted the nomination in the belief that only thus could a split in his party be prevented. He campaigned extensively, but, deserted by Populist leaders, attacked by Democratic managers, and avoided by Bryan, he admitted his position was "most humiliating." He believed the policy of fusion and office-grabbing had worked the ruin of Populism.

Disillusioned and somewhat embittered, Watson retired from political life for eight years. Turning to writing during his retirement he produced a two-volume history of France, biographies of Napoleon, Jefferson, and Jackson, and an autobiographical novel. On the lecture platform he denounced imperialism and the Spanish-American War, and for a time preached southern sectionalism of the Confederate kind, engrafted on his anti-industrialism. These works and others are examined and criticized in the light of his Populist ideology.

In 1904 Watson appeared on the national scene again as the Populist candidate for President, chiefly in protest against the reactionary candidate of the Democrats. The next year he founded *Tom Watson's Magazine*, a journal of the muckraking-reform type, chiefly a vehicle for Watson's editorials. His candidacy for President in 1908 was only a gesture. In the meanwhile he had become virtual political boss of Georgia, arbitrarily shifting his following from one rival faction of the Democrats to the other. His coöperation with the Democrats began in a reform campaign in 1906, but thereafter his leadership degenerated in character to the plane of sensational crusades against Catholicism, the Negro, socialism, and Leo Frank, a Jew. They are studied in the light of the psychology of frustration—both in the man and in his following, and in the light of new class alignments among the farmers.

With sudden resurgence of his old spirit, he denounced American intervention in the World War and opposed conscription. His publications were shut out of the mails. In a campaign against the League of Nations and the restriction of civil liberties, he was overwhelmingly elected to the Senate in 1920. His brief career in the Senate, ended by death, was sensational in defense of oppressed minorities and Soviet Russia, but barren of accomplishment.

The following master's theses were completed under the direction of the Department during the year:

William Brantley Aycock. Tobacco Regulation in Colonial Virginia. (Under the direction of Hugh T. Lefler.)

The Virginia Company of London first attempted to regulate tobacco in Virginia in order to induce the colonists to produce the necessary food crops. The Crown imposed numerous restrictions on colonial tobacco in an effort to derive revenue from the tobacco trade. The Virginia Assembly passed numerous laws designed to control the production and distribution of tobacco in an effort to improve its price. Plans for intercolonial regulation of tobacco in 1666-1667 never materialized. The Tobacco Rebellion brought forth an illegal destruction of tobacco by some of the same individuals who refused to coöperate with the colonial government in its efforts to reduce the output. The inspection system established in Virginia after 1730 brought good results. With that exception, all laws which emanated from the first governors of the colony, the Virginia Company, the English Authorities, and the Colonial Legislature for the purpose of controlling the production and distribution of tobacco were never successful.

JAMES ROY CALDWELL, JR. Lotteries in North Carolina. (Under the direction of A. R. NEWSOME.)

This is a study of the use of the lottery in North Carolina. Between 1759, when the first lottery privilege was granted, and 1834, when the institution was abolished, one hundred and seven lotteries were authorized by the legislature. Fifty-four were for the benefit of schools; thirty for the promotion of internal improvements; seven for manufacturing establishments; six for churches, and ten for such miscellaneous purposes as building poorhouses, aiding Masonic lodges, and writing a history of the state. The study quite naturally fell into seven divisions or chapters, the titles of which are as follows: Historical Background, An Analysis of North Carolina Lotteries, Lotteries for the Benefit of Educational Institutions, Lotteries for the Promotion of Internal Improvements, Lotteries for the Benefit of Churches and the Promotion of Manufactures, Lotteries for Miscellaneous Purposes, and the Abolition of Lotteries in North Carolina.

RACHEL CARROLL. Benjamin Franklin: Colonial Agent to Great Britain, 1757-1762. (Under the direction of HUGH T. LEFLER.)

The purpose of this study has been to trace chronologically the work of Benjamin Franklin as the agent of the Pennsylvania Assembly to Great Britain.

The study is divided into six parts. Chapter I deals primarily with the organization and procedure of the colonial agency. Chapter II gives a background of the issues in Pennsylvania history with which Franklin was concerned as provincial agent (1754-1757). Chapter III is concerned with the beginning of Franklin's negotiations in England (1757-1758). Chapter IV surveys the busiest year (1759) of Franklin's agency. A full treatment of the William Smith Scandal, which case served to define the rights of colonial assemblies, and of the Teedyuscung-Penn quarrel, which

grew out of the Walking Purchase, is given. Chapter V covers the last years in England (1760-1762). During this period Franklin achieved his most notable success—the right of the Pennsylvania Assembly to tax the proprietary estates. Chapter VI gives a summary of Franklin's final report to the Pennsylvania Assembly and a brief discussion of those characteristics, acquired in England, that preëminently fitted him for diplomatic service in England and France.

Ernest Wesley Cason. L'Abbé-Grégoire in the Committee of Public Instruction of the National Convention. (Under the direction of Carl Hamilton Pegg.)

L'Abbé Grégoire played a conspicuous rôle in the work of the Committee of Public Instruction. He opposed the system of national schools advocated by the radicals of the Terror and at the same time sought a broader elementary curriculum than that provided by the final education law. He believed education to be a bulwark of democracy. Instrumental in the suppression of the learned academies, he sought their reorganization in the National Institute. His campaign against vandalism preserved for future generations a vast intellectual and artistic heritage. To him must go the greater credit for the organization of public libraries. The Conservatory of Arts and Trades and the Bureau of Longitudes were principally his creations.

Martha Corbitt Chapman. Indian Relations in Colonial North Carolina, 1584-1754. (Under the direction of Hugh T. Lefler.)

The purpose of this study is to point out changing attitudes between the English and Indians in their struggle with each other for supremacy in North Carolina until 1754. Tribes of three great Indian nations resided on the land which was granted by Charles II to the Proprietors in 1663. The first colonizers who had come in 1584 found friendly Algonquin Indians, who turned hostile when they perceived selfish colonizing motives in the whites. The Proprietors changed from an attitude of Christian prerogative over the savages in 1663 to a benevolent policy of exploitation of them in 1700. When in 1711 the Indians rebelled against English aggression and nearly exterminated the colony, which was beginning to be profitable to England, the king bought out the Proprietors' shares and made both North and South Carolina royal provinces. The signing of a national treaty with the Cherokees showed the king's desire to appeal to the Indians' national integrity. Instructions to governors to placate the tribes and the setting up of Indian commissions proclaimed the new method by which the king and his colonies planned to outwit both the French and Indians in the war which began in 1754.

Edward Hiram Gibson, III. Hospices and Hospitals in France in the Early Middle Ages. (Under the direction of L. C. MacKinney.)

The purpose of this study is to mobilize the available information on the hospices and hospitals of medieval France. An attempt is made to re-evaluate the sources, with the following results: The typical institution of charity during the earlier centuries (500-1100 A.D.) was the hospice (usually called the *xenodochium*). Its purpose was the care of both pilgrims and the local poor, whether able-bodied or sick. But only in rare instances was the hospice provided with medical service. The true hospital, therefore, was not a development of this period. In the later medieval centuries the Crusades and the expansion of town life led to a general secularization of charity and to a specialized medical service in the hospice. By the fifteenth century the hospice was commonly known as a *Hotel-Dieu* or *Maison-Dieu;* and, by reason of its full-time medical staff, it had evolved into what may properly be called a hospital.

WILLIAM HENRY KAMPSCHMIDT. Lycurgus, the Eminent Statesman and Financial Administrator of the Athenian Commonwealth. (Under the direction of W. E. CALDWELL and J. C. RUSSELL.)

This is a comprehensive study of the life and activities of Lycurgus, a preëminent fourth century Athenian financier. The first chapter gives a detailed biographical sketch of the statesman. The second chapter is devoted to the administration of Lycurgus and discusses in particular his title and duties, his extensive military and religious activities, and his financial administration.

The thesis shows that Lycurgus was head of the financial system of Athens from 338 to 326 B. C. during which time he brought the revenues to unprecedented heights by a systematic check on the income and expenditures of the city. By proper management he improved the army and strengthened the navy, completed and restored many buildings, among which the arsenal of Philo, the stadium, and the Dionysiac Theater are the most outstanding. He fortified the city and the harbor Peiraeus and added much wealth and beauty to Athens in various ways. His deeply rooted religious convictions caused him to be mindful of the life and morals of the people, which he endeavored to keep on a high plane by precept and example. Although his methods were challenged by his opponents, they were found by the courts to be just, wise, honest, and efficient.

His exceptional management caused the citizens to bestow upon him many public honors in life and after death. Because of his extraordinary success in secular, religious, and financial matters he stands out today as among the greatest statesmen and financiers of the fourth century.

JULES ALEXANDER KARLIN. The French Annexation of Avignon and the Comtat Venaissin in 1791. (Under the direction of MITCHELL B. GARRETT.)

The purpose of this study is to narrate the story of the annexation of these papal enclaves, emphasis being placed upon the debates in the

National Assembly. After a sketch of the history of the territory, which was formerly French, the chapters alternate between the embattled enclaves, split by internecine warfare and factional intrigues, and the National Assembly, the scene of many debates in which right and left attempted to sway an undecided center. The left finally persuaded the Assembly to decree annexation on September 14, 1791, after provisional measures had failed and after the center had become convinced that the people of the territory favored annexation. In the conclusion the relationship between annexation and Rousseau's doctrine of popular sovereignty is pointed out.

Mary Banks McPherson. The Administrations of Governor Sir Francis Nicholson in Virginia. (Under the direction of Hugh T. Lefler.)

The study of Nicholson's administrations as governor of Virginia include his administration as lieutenant-governor (1690-1692) and his administration as governor (1699-1705), as well as an investigation of his controversies with the assembly and the clergy during his last administration.

James W. Rabun. Georgia and the Creek Indians. (Under the direction of A. R. Newsome.)

Among the most persistent and significant problems with which Georgia had to deal in its first hundred years was its relationship with the Creek Indians, the original occupants of the lower two-thirds of the state.

This study traces in detail the commercial and diplomatic means by which Georgia sought to regulate intercourse with the Indians; the hostilities of the Creeks in the Revolution, in 1785-1793 and in 1813-1814; the persistent demands of an expanding white population for Creek lands; the efforts of the United States after 1796 to civilize the Creeks; the growing exasperation of Georgia at what it considered the remissness of the United States in carrying out an agreement made in 1802 to extinguish the Indian title to lands in Georgia; the manner in which this exasperation led to an explosive outburst of state rights feeling in 1826-1827; and the final steps by which the Creeks were removed beyond the Mississippi.

These details are presented chronologically, with a discussion and analysis of the issues involved.

William Lawrence Rhyne. Joseph Chamberlain and South Africa: To the Outbreak of the Boer War in 1899. (Under the direction of Henry McGilbert Wagstaff.)

This thesis traces the relation of Joseph Chamberlain to the course of South African history until the outbreak of the Boer War. The study shows how the issue of Boer against Briton, begun long before Chamberlain's time, gradually reached a climax under the guidance of Chamberlain; how in his capacity as Colonial Secretary in the British Cabinet, Chamberlain, with the aid of Cecil Rhodes and Alfred Milner, used the questions of

reform and suzerainty as the path to an ultimate goal—the overthrow of the Boer governments and the establishment of British supremacy in South Africa; and, finally, how Chamberlain, through his keen oversight and political sagacity, led a sufficient number of the British people to this climax by making them believe Paul Kruger and the Boers were the aggressors. In order to do this Chamberlain had to disavow the Jameson Raid and its effects, although he was at heart in sympathy with the principles back of it. Chamberlain had a place for South Africa in his scheme for British imperial federation not then fully developed.

DOROTHY SEAY. A Georgia Planter and His Plantations, 1837-1861. (Under the direction of F. M. GREEN.)

This thesis is a study of George James Kollock, a Georgia planter, and his plantations from 1837 to 1861. It is based almost entirely upon the eighteen volumes of Kollock Plantation Records in the Library of the University of North Carolina and upon the Kollock family and overseer's letters in private possession.

Kollock was a kind and an indulgent master and had little disciplinary problems with his slave force except under one overseer who seemed wholly unfitted for his position. Like so many other planters of the Old South, Kollock was enmeshed in the credit system and was forced to rely upon Robert Habersham, his factor in Savannah, for credit and assistance in buying supplies and selling the staple crops. The records show that Kollock was a progressive and scientific planter, interested in diversification of crops, drainage, and fertilization, and that he gradually increased his landholdings and the size of his slave force. Cotton was the staple crop raised on the plantation, but corn, rice, and other food crops together with live-stock were produced in almost sufficient quantities to supply both the labor force and the work stock.

The conclusion is reached that the Kollock plantations were much more nearly self-sufficient than was true of the plantation system generally.

ANNE BLANCHE STEWART. A Critique of *Uncle Tom's Cabin.* (Under the direction of A. R. NEWSOME.)

Many historians attribute political influence, particularly the rise of the Republican party, to Harriet Beecher Stowe's *Uncle Tom's Cabin,* published in 1852. In spite of its wide circulation, its dramatization and popularity as a play, and the criticism it provoked, the book possessed little significance in American history. A study of the sources used by Hermann von Holst and James Ford Rhodes, on whom other historians have relied without apparent independent research, showed that they made improper and insufficient use of the original evidence.

PHILIP JOHNSON WEAVER. Gubernatorial Election of 1896 in North Carolina. (Under the direction of HOWARD K. BEALE.)

The year 1896 brought a political revolution in North Carolina. This revolt ended with the complete overthrow of the Democratic party, the traditional guardian of the white people of the state. There had been earlier demands for reform, but these had gone unheeded. This led to the development of the Populist party in the state and its subsequent fusion with the Republicans. In 1894 these two parties managed to capture control of the Legislature. This body passed a new election law granting suffrage to many people, mostly Negroes, who had not voted under the Democratic regime. In 1896 attempts at fusion on the gubernatorial ticket failed, but the number of increased Negro voters proved enough to elect the Republican nominee, Daniel L. Russell. The victory of the Republicans, made possible by the Negro vote, eventually led to their overthrow on the "white supremacy" issue.

THE SCHOOL OF LAW

Members of the faculty of the Law School, at the close of the 1937 legislative session, coöperated in the preparation of an article published as A Survey of Statutory Changes in North Carolina in 1937, 15 *North Carolina Law Review* 321-392, June, 1937.

M. S. Breckenridge has published during the year:

Book Review, Stevens, *Handbook of the Law of Private Corporations,* 4 *University of Chicago Law Review* 516, April, 1937.

Book Review, Dodd, *Administration of Workmen's Compensation,* 15 *North Carolina Law Review* 448, June, 1937.

Albert Coates has published during the year:

Law Enforcing Officers in North Carolina, 15 *North Carolina Law Review* 1, December, 1936.

The Law of Arrest in North Carolina, 15 *North Carolina Law Review* 101, February, 1937.

Limitations on Investigating Officers, 15 *North Carolina Law Review* 229, April, 1937.

Book Review, Bates, *Prisons and Beyond,* 15 *North Carolina Law Review* 443, June, 1937.

F. W. Hanft has published during the year:

Utilities Commissions as Expert Courts, 15 *North Carolina Law Review* 12, December, 1936.

Book Review, Robson, *Civilization and the Growth of Law,* 15 *North Carolina Law Review* 97, December, 1936.

Book Review, Smith, Dowling and Hale, *Cases on Public Utilities,* 23 *Virginia Law Review* 498, February, 1937.

Book Review, Sturges, *Cases on Credit Transactions,* 15 *Texas Law Review* 400, April, 1937.

FRED B. MCCALL has published during the year:

Book Review, Simes, *The Law of Future Interests,* 15 *North Carolina Law Review* 225, February, 1937.

Editor and co-author with PROFESSORS DAVID F. CAVERS, of Duke University, and R. B. WHITE, of Wake Forest College, of the Report of the Commission on the Revision of the Laws of North Carolina Relating to Estates.

JOHN E. MULDER has published during the year:

The Defaulting Plaintiff in North Carolina, 15 *North Carolina Law Review* 255, April, 1937.

M. T. VAN HECKE has published during the year:

Book Review, Griswold, *Spendthrift Trusts,* 15 *North Carolina Law Review* 306, April, 1937.

Book Review, Lyon, *The Constitution and the Men Who Made It,* 15 *North Carolina Law Review* 221, February, 1937.

Book Review, Rodell, *Fifty-five Men,* 15 *North Carolina Law Review* 221, February, 1937.

Book Review, McClintock, *Handbook of Equity,* 15 *North Carolina Law Review* 223, February, 1937.

R. H. WETTACH has published during the year:

Book Review, Swisher, *Roger B. Taney,* 37 *Columbia Law Review* 511, March, 1937.

Book Review, Smith, *Roger B. Taney,* 37 *Columbia Law Review* 511, March, 1937.

Book Review, Shriver, *Justice Oliver Wendell Holmes, His Book Notices and Uncollected Letters and Papers,* 9 *Mississippi Law Journal* 506, April, 1937.

Book Review, Stumberg, *Principles of Conflict of Laws,* 15 *North Carolina Law Review* 456, June, 1937.

The School of Law has the following studies in progress:

F. W. Hanft

Legal Education Yields to the Times.

Fred B. McCall

The Destructibility of Contingent Remainders in North Carolina, to be published in the *North Carolina Law Review.*

Work continued as member of Commission on Revision of the Laws of North Carolina Relating to Estates.

D. W. Markham

Why a "Burden of Going Forward?"

M. T. Van Hecke

Juries in Equity Cases, to be published in the *North Carolina Law Review.*

R. H. Wettach

Studies on Problem of Contributory Negligence in Wrongful Death Cases.

THE LIBRARY AND THE SCHOOL OF LIBRARY SCIENCE

Robert B. Downs has published:

The South Looks at Its Libraries. *Social Forces,* XV: 123-127. 1936.

The South and Its Libraries. *American Scholar,* VI: 245-248. 1937.

Lucile Kelling has the following studies in progress:

The *Consolatio* in Greek and Roman Literature.

There are a number of examples of *Consolationes* in Greek and Roman literature. The ideas, words, and phrases show an interesting correspondence. This study is an attempt to determine the continuity of ideas, form, and language in this highly specialized literature.

(With A. I. Suskin.) *Index Verborum Iuvenalis.*

The Index is to be a complete index of all words, including proper names, based on the latest critical edition.

LAWRENCE F. LONDON has had accepted for publication by *The North Carolina Historical Review,* three articles on George E. Badger, as follows:

George Edmund Badger, His First Years in the United States Senate, 1846-1849.

George Edmund Badger and the Compromise of 1850.

George Edmund Badger, His Last Years in the United States Senate, 1851-1855.

DR. LONDON has in the process of compilation A Bibliography of Unofficial Confederate Imprints, 1861-1865. (In collaboration with ROBERT B. DOWNS, Librarian of the University of North Carolina Library.)

This work will include as nearly as possible all materials of an unofficial nature published in the Confederate States, such as: fiction, history, music, textbooks, pamphlets, newspapers, and periodicals. Wherever it is possible the names of the libraries owning these imprints will be given.

He has in the early stages of research a biography of Joseph Blount Cheshire, Bishop of the Diocese of North Carolina from 1893 to 1932.

DEPARTMENT OF MATHEMATICS

ARCHIBALD HENDERSON has recently completed an extended monograph on a problem in Euclidean Geometry which has attracted the attention of many mathematicians during the past century. This paper contains a large number of new solutions of the problem of the internal bisectors of the base angles of a triangle. The problem is generalized; and study is made of numerous cases which arise. The configuration is found to have intimate relationships with three higher plane curves: the logarithmic spiral; the conchoid, and the cardioid.

The substance of this paper was presented before the North Carolina Academy of Science, Catawba College, Salisbury, N. C., May, 1937. It was the subject of PROFESSOR HENDERSON'S presidential address before this university's chapter of Sigma Xi, May, 1937.

ARCHIBALD HENDERSON, in collaboration with JOHN W. LASLEY, JR., has recently completed an extended paper entitled On Harmonic Separation. The paper falls into two parts: (1) an historical survey

of the problem of four distinct points on a straight line, of which one pair separates the other pair harmonically; (2) a number of linear and quadratic constructions, some possessing elements of novelty, for the configuration of harmonic separation.

JOHN W. LASLEY, JR., has completed, in collaboration with ARCHIBALD HENDERSON, a paper on harmonicals mentioned above.

PROFESSOR LASLEY has completed a study of the classification of collineations from the standpoint of the Jordan canonical form of a matrix. This approach avoids the necessity of proving theorems as to the incidence of double elements. It utilizes duality, bringing in the double lines on a parity with the double points. It emphasizes more than ordinarily the algebraic implications incident to certain usually imposed geometric conditions. The necessity of recognizing the invariance, both of the rank of the characteristic matrix and of the roots of the characteristic equation, is kept in the foreground. Hypotheses as to rank are encountered naturally. Conclusions as to incidence of double elements and as to the final canonical form of the collineation are allowed to follow unimpeded from the algebraic expression.

PROFESSOR LASLEY is engaged in the application of projective geometry concepts to the problem of establishing in easily remembered third determinant form the equation of the characteristic lines of a surface at an ordinary point of it.

He has under his direction the following:

R. C. BLACKWELL. (Progress on doctor's dissertation.) The Osculating Cubics of a Plane Curve.

N. DI COSTANZO. (Progress on master's thesis.) On the Relation Between Projective Geometry and Theory of Equation.

R. D. VOGLER. (Progress on master's thesis.) Certain Methods of Approximation for the Theory of Equations.

ANNIE JOHN WILLIAMS. (Progress on master's thesis.) Some Relations Between Metric and Projective Differential Geometry.

E. T. BROWNE has published:

Observations on the Study and Teaching of Mathematics. *The Mathematics Teacher,* XXX: 4. April, 1937.

The above was an address before the Pi Mu Epsilon Mathematical Fraternity at Duke University, March 11, 1936.

He has completed his paper on Sets of Conjugate Matrices. This will appear in full in an early issue of the *American Journal of Mathematics.*

PROFESSOR BROWNE has under his direction the following:

H. M. NAHIKIAN. (Progress on doctor's dissertation.) Matrices Commutative with a Given Matrix.

H. V. PARK. (Progress on doctor's dissertation.) Matrices A and B such that AB and BA have the same Reduced Characteristic Function.

(See *Research in Progress,* October 1936, p. 68.)

JOHN MUNCH. (Progress on master's thesis.) A Comparison of the Methods of Attack on Fermat's Last Theorem for the case n=3.

V. A. HOYLE is directing the following research:

C. L. SEEBECK, JR. (Progress on doctor's dissertation.) An Extension of the Theory of Paths.

REINHOLD BAER has published during the year:

Gruppen mit von Zentrum wesentlich verschiedenem Kern und abelscher Faktorgruppe nach dem Kern. *Compositio Mathematica,* **4**: 1-77. 1936.

The Subgroup of the Elements of Finite Order of an Abelian Group. *Annals of Mathematics,* **37**: 766-781. 1936.

Primary Abelian Groups and their Automorphisms. *American Journal of Mathematics,* **59**: 99-117. 1937.

Abelian Groups Without Elements of Finite Order. *Duke Mathematical Journal,* **3**: 68-122. 1937.

Dualism in Abelian Groups. *Bulletin of the American Mathematical Society,* **43**: 121-124. 1937.

Equivalence of Algebraic Extensions. *Bulletin of the American Mathematical Society,* **43**: 432-437. 1937.

PROFESSOR BAER has the following research in progress:

Report on "Allgemeine Körpertheorie" for the new edition of the volumes on Algebra and Arithmetic of the *Enzyklopädie der Mathematischen Wissenschaften.*

Abelian Fields and Duality of Abelian Groups. (To appear shortly in *American Journal of Mathematics.*)

E. Witt has recently characterized the finite abelian extensions of commutative fields by means of invariants. Witt's theory may be extended, almost without modification, to all those extensions whose group is abelian (finite or not). This may be done by the simple device of substituting Pontrjagin's duality theory for the classical theory of characters of finite abelian groups.

Groups with Abelian Central Quotient Group. (To appear shortly in *Transactions of the American Mathematical Society.*)

The method employed throughout this investigation of groups which have abelian central quotient groups may be described as follows: If G is such a group, then preference is given to a subgroup S, situated between the central and the commutator group of G. Now G and S determine $G^*=G/S$ and certain invariant relations between the abelian groups G^* and S. The groups S and G^*, and these relations between G^* and S, are invariants of G, if S is in particular either the central or the commutator group of G. In general these invariants do not completely determine the structure of G. They form a complete set of invariants, however, if G^* is a direct product of cyclic groups, and this is the only hypothesis restricting the generality of this method.

Groups with Preassigned Central and Central Quotient Group. (To appear shortly in *Transactions of the American Mathematical Society.*)

It is well known that not every abelian group is the central quotient group of a suitable group, and those abelian groups with a finite number of generators which are central quotient groups have been characterized before. This note is devoted to a characterization of those pairs of groups C, Q which are central and central quotient group, respectively, of a suitable group. This problem is completely solved under the hypothesis that Q is a direct product of cyclic groups. The necessary and sufficient conditions for the existence of a group whose central is the abelian group C, and whose central quotient group is the direct product Q of cyclic groups, essentially relate the number of cyclic direct factors of Q whose order is n and the number of independent elements of order n in C. Similar conditions characterize those pairs of an abelian group C and a

direct product Q of a finite number of cyclic groups so that there exists one, and only one, group whose central is C and whose central quotient group is Q.

N. JACOBSON has published:

Pseudo-Linear Transformations. *Annals of Mathematics,* **38**: 2: 484-507. 1937.

A Class of Normal Simple Lie Algebras of Characteristic Zero. *Annals of Mathematics,* **38**: 2: 508-517. 1937.

Abstract Derivation and Lie Algebras in the *Transactions of the American Mathematical Society,* **42**: 2: 206-224. 1937.

A Note on Non-Associative Algebras in the *Duke Mathematical Journal,* **3**: 3: 544-548. 1937.

p-Algebras of Exponent p in the *Bulletin* of the American Mathematical Society, **43**: 10: 667-670. 1937.

A Note on Topological Fields in the *American Journal of Mathematics,* **59**: 4: 889-894. 1937.

Abstracts of all but the first of the above listed papers have appeared in the *Bulletin* of the American Mathematical Society.

A paper, Simple Lie Algebras of Type A, by MR. JACOBSON, has been accepted for publication by *Annals of Mathematics.* An abstract of this paper has appeared in the *Proceedings* of the National Academy of Science, **23**: 4: 240-242. 1937.

MR. JACOBSON is preparing for publication a paper on Simple Lie Algebras over Real Closed and p-adic Fields and a paper on Simple Lie Groups and their Automorphisms.

The following master's theses were accepted by the Department during the year:

CULLEN PAUL BROOKS. Historical Development of the Cross Ratio Concept. (Under the direction of J. W. LASLEY.)

The purpose of the thesis is to trace the idea of the cross ratio from the earliest instance of its occurrence in the works of the Greeks up to the present. The first section, Part I, lists the contributions of the ancient Greeks, taking up the following men in the order named: Archytas, Apollonius, Menelaus, Serenus, and Pappus. Part II deals with the later period of development, which includes the following men in the respective order: Desargues, La Hire, Carnot, Poncelet, Mobius, Chasles, Steiner, and Von Staudt.

Origin of the different names for the cross ratio is shown, and illustrations and examples are displayed from each of the men who are discussed. Some attempt is made to show the connection of the cross ratio with various branches of geometry.

CHARLES LEMUEL CARROLL, JR. The Rôle of The Imaginary In Projective Geometry. (Under the direction of J. W. LASLEY, JR.)

A brief historical summary of the imaginary in geometry was given in the first chapter. Included in this was an outline of the work from the time of Wallis down to the present time. More space was given to the work of Von Staudt and Veblen and Young because theirs is the popular viewpoint today. In the second chapter all of the imaginary concepts introduced in a first course in projective geometry were considered. It was found that each of these could be traced back to one of three origins: solution of an algebraic equation, measurement of distance in the imaginary domain, or measurement of angle in the imaginary domain. A discussion of these three ideas was then given showing their validity. In the final chapter some of the best known properties of imaginary elements were listed. Following this were several construction problems illustrating these properties.

ELIZABETH JOHNSON. Certain Riemann Surfaces. (Under the direction of ERNEST L. MACKIE.)

The purpose of this paper is to construct, in general, the Riemann surfaces of algebraic functions of the types $W^2=f(z)$ and $W^3=f(z)$ where $f(z)$ is an integral rational function with zeros distinct.

In order to make a generalization for these functions, this paper shows the investigations of several particular algebraic functions of the second and of the third degree as to their branch-points and junctions lines.

ROBERT EDWARD SMITH. Applications of the Moving Trihedral. (Under the direction of J. W. LASLEY, JR.)

Many problems in curves and surfaces are more easily and more elegantly treated by using the moving trihedral. The moving trihedral consists of a trirectangular set of axes formed by the tangent, the principal normal, and the binormal to a curve at a point. Thus the method of the moving trihedral is that of a local reference frame, that is, one that moves along the curve. It is the purpose of this thesis to develop the fundamental formulas connected with the moving trihedral and to present some of the more elementary applications of the theory. Applications are given to involutes, evolutes, parallel curves, canal surfaces, osculating spheres, and to other problems. Several more advanced applications are mentioned in a final chapter. It has been impossible in a paper of this size to do more than indicate the power and beauty of the method of the moving trihedral.

DEPARTMENT OF MUSIC

GLEN HAYDON has completed the translation of Knud Jeppesen's *Kontrapunkt.*

PROFESSOR HAYDON is writing a text-book on Musicology, and is directing the following research:

PETER HANSEN. The Life and Works of Phinot. (For the doctor's degree.)

KATHRYN KENNARD. Beginnings of the Violoncello Sonata. (For the master's degree.)

BENJAMIN F. SWALIN has published the following paper:

The Brahms Violin Concerto. Music Teachers National Association *Proceedings,* 1936, pp. 269-281.

PROFESSOR SWALIN has completed the following articles:

The Psychology of Music Listening.

The Cultural Basis for the Music of the Seventeenth Century.

He has in progress:

Translation into English of his dissertation Das Violinkonzert der deutschen Romantik (doctoral dissertation, University of Vienna, 1932).

Preparation of a book entitled *A Study of Modern Orchestral Works.*

JAN PHILIP SCHINHAN has completed the following research:

The Music of the Papago and Yurok: A Study of the Culture of the South and North of the Pacific Coast (doctoral dissertation, University of Vienna, 1937).

On the basis of electrical recordings, made of one singer each of two Indian tribes of the Pacific coast, the cultures of these two peoples were examined in the light of the most recent findings in comparative Musicology and the resultant data compared. Although some songs of both of these tribes were recorded and analyzed a few years ago, it became apparent that the result of these investigations could not stand when subjected to truly scientific tests. It is to fill the gap left by these previous analyses that this work was undertaken.

Heine as Music Critic. (Revised and enlarged.)
A study of musical criticism as exemplified in Heine's writings, compared with contemporary professional writers as well as those of a later period.

Critical survey of work done, dissertations and books written on the origins of music, with special consideration of the Indian Music of the Pacific Coast.

Translations of: Bach's Motets from *Führer durch den Konzertsaal* by H. Kretzschmar. Dirigent und Publikum by Dr. E. Kunwald from "Die Glocke."

PROFESSOR SCHINHAN has in progress:

The translation of the above-mentioned dissertation.

A critical review of the *Handbook on Papago Music* by Fr. Densmore.

Continuation of the study of North Carolina Folk Music.

DEPARTMENT OF PATHOLOGY

RUSSELL L. HOLMAN has published, while in the Department of Pathology of Columbia University:

Capillary Permeability and Age. The Flow and Protein Content of Subcutaneous Lymph in Dogs of Different Ages. *American Journal of Physiology,* **118**: 354. 1937.

(With JOHN J. HAWTHORNE.) Tuberculosis of the Myocardium. Report of two cases. Presented before the New York Pathological Society, January 28, 1937, and abstracted in *Archives of Pathology,* **24**: 115. 1937.

PROFESSOR HOLMAN has the following research in progress:

(With E. B. SELF.) The Nutritive Function of Lymph. The Ability of Lymph to Maintain Vitality in Lymph Nodes Deprived of Blood. Paper in process of being written.

Complete Anuria Due to Blockage of the Renal Tubules by "Bence-Jones Protein Casts" in a Case of Multiple Myeloma. A case report in process of being written.

The Effects of Ligation of the Vasa Vasorum on the Media of Muscular Arteries. Paper in process of being written.

Continuation of Studies on Lymph and the Lymphatic System.

DEPARTMENT OF PHARMACOLOGY

WM. DEB. MACNIDER has published:

The Acquired Resistance of Fixed Tissue Cells to Chemical Injury. *Southern Medical Journal,* **29**: 1198. 1936.

A Partial Survey of Investigations Concerned With the Formation of Urine, Accompanied by Certain Deductions of a Biological Order. *The Diplomate,* **9**: 1: 7. 1937.

A Study of the Acquired Resistance of Fixed Tissue Cells Morphologically Altered Through Processes of Repair. IV. Concerning the Persistence of an Acquired Type of Atypical Liver Cell with Observations on the Resistance of Such Cells to the Toxic Action of Chloroform. *Journal of Pharmacology and Experimental Therapeutics,* **59**: 393. 1937.

The Department of Pharmacology is interested at the present time in four major research problems:

A continuation of the study of sequence of changes that occur in the kidney as a result of inducing a chronic type of nephritis.

A study of tissue obtained from such animals as biopsy material in which the changes of an anatomical nature are studied in connection with the mode of urine formation by such injured kidneys.

Changes in such material are being investigated in terms of the diseased state representing either an ontogenetic or phylogenetic reversion on the part of such tissue.

The studies are in progress on the acquired resistance of fixed tissue cells which may develop as a result of repair process secondary to an injury. These studies are not only being carried out in the higher animals, such as the dog, but in lower forms of animal life.

SCHOOL OF PHARMACY

HENRY M. BURLAGE has been engaged in the following studies during the year:

A Survey of Drugs and the Drug Industry of North Carolina (with M. L. JACOBS).

The Constituents of White Snakeroot.

Phyto-chemical Studies of Piscaria (*Eremocarpus setigera*) I. Examination of the Oil of the Seed.

Chrysopsis graminifolia, its Composition and Preparations. (Preliminary Study.) *Journal of American Pharmaceutical Association,* **26:** 415-418. 1937.

The Assay of Lead Oleate Plaster and Ointment.

PROFESSOR BURLAGE is working on a book dealing with The Medicinal Plants of North Carolina (with M. L. JACOBS).

M. L. JACOBS has completed the following research during the year:

The Use of New Solvents in Alkaloidal Assays. *Journal of the American Pharmaceutical Association,* **26:** 599-609, 1936. The second part of this research was presented before the American Pharmaceutical Association in August, 1937.

PROFESSOR JACOBS has been engaged in the following studies during the year:

A Phyto-chemical Study of *Kalmia angustifolia* L. (With WILLIAM R. LLOYD.)

Continuation of a Survey of Drugs and the Drug Industry in North Carolina. (With H. M. BURLAGE.)

PROFESSOR JACOBS is working on a book on The Medicinal Plants of North Carolina. (With H. M. BURLAGE.)

DEPARTMENT OF PHILOSOPHY

GEORGE F. THOMAS has published:

Can We Believe in Progress? *Religion in Life,* VI: 1: 70-84. 1937.

A Reasoned Faith: essay published in a volume of collective authorship (in honor of Professor D. C. McIntosh) entitled *The Nature of Religious Experience.* New York: Harper Brothers. 1937.

PROFESSOR THOMAS delivered three lectures on the nature of the human spirit and its moral and political significance entitled *Spirit, Its Freedom and Power,* to be published this winter by the University of North Carolina Press as the Calvin McNair Lectures for 1937.

LOUIS OSGOOD KATTSOFF has completed:

Modality and Probability. *Philosophical Review,* XLVI: 1: 78-85. January, 1937.

A proof that modalities of modal logics are identical with probabilities.

Reichenbach's *Wahrscheinlichkeitslehre. Philosophical Review,* XLV: 6: 625-630. November, 1936.

A critical review of Reichenbach's new book and an attempt to indicate the need for a complete modal logic having a continuous infinite number of modes.

A brief review of Hempel and Oppenheim's *Der Typusbegriff im Licht der Neuen Logik.* To appear in *Philosophical Review.*

Non-Aristotelian Logic and the Crisis in Modern Science. To appear in *Scientia.*

The crisis in modern science is shown not to be one solvable by means of modal logics but is merely a dialectic transitional stage. The rôle of the dialectic in the development of modern science is indicated.

Are Eddington's Idealistic Extrapolations Justified?

An attempt to demonstrate that Eddington's views on the nature of reality are justified.

An Experiment in Teaching Elementary College Logic. Submitted to the *Progressive Education Journal.*

A report of the results of an attempt to introduce more individualised techniques in elementary logic.

A Logical Analysis of Rhine's work on *Extra-Sensory Perception.* (Read to Psychological Colloquim of Duke University.)

Group Theory for Truth-Values. Submitted to *Erkenntnis.*

This paper breaks ground in a new direction for the solution of the problem of multi-valued logics. Revised in part, it is now ready for publication.

He has in progress:

Hegel and Croce on the "Begriff."

An attempt to show that Croce's critique of Hegel is based on a misunderstanding.

A Commentary on Hegel's *Wissenschaft der Logik,* fairly well under way.

Philosophy of Mathematics. Three chapters have been completed: Chapter I, Philosophy and Mathematics; Chapter II, Definitions of Mathematics; Chapter III, The Nature of the Mathematical Object. Twelve additional chapters are in progress.

A Text-book in Logic.

Hegel and Husserl on the concept "Wissenschaft."

A comparison of Hegel's and Husserl's meaning of "Wissenschaft" and their doctrine of the relation of *Wissenschaft* to knowledge.

EDGAR FRANKLIN WELLS has completed:

The Logical Development of the Concept of Value. (Under the direction of L. O. KATTSOFF.) Buchan Prize Thesis.

The problems that confront man in his attempt to attain the Good must be solved by the dialectic method. The operation of the method is shown in its historical context. Though it is admitted that no adequate methodology for systematic and scientific estimation of values has as yet been developed, it is demonstrated that certain principles of both cognition and volitional character must be utilized.

The following doctoral dissertation was accepted during the year by the Department:

CONVERE JONES BURWELL. The Relation of Hegelian Epistemology to the Development of Individuality. (Under the direction of H. H. WILLIAMS.)

This study is an attempt to justify the place of epistemology in the Hegelian system of philosophy. Epistemology is shown as the medium through which metaphysics as the objective Absolute and the logic as the individual's statement of the Absolute are identified.

The epistemological process begins in the first stage of consciousness to reconcile through knowledge the apparently contradictory dual manifestations of the *Idee* — the *Sein* and *Denken.* As the individual acquires knowledge in the epistemic relation, individuality develops concomitantly. The tracing of this individual development in line with the development of the mind (one of the three essential aspects of personality) reveals that progress in aesthetic culture and religious growth are to a great extent predicated upon the development of the mind.

In the second stage of the evolution of individuality (consciousness) the place of error and the power of the dialectic method of thought are the most important aspects of the epistemological activity of the mind in acquiring knowledge of the physical world particularly.

In the highest stage of consciousness (self-consciousness), the mind is synonymous with reason. The categories of the logic (in line with which the mind has developed through the two preceding stages) are used by the individual to attain his desired aims. The mind is potent to comprehend reality and to direct activity. Behavior and thought are integrated through the development of the mind via the epistemological process. The mind has accumulated the value of the positing of all experience and thought. It is the culmination of all conditioning of experience, past, and present.

Logic becomes identified with metaphysics. Hegel has expressed his metaphysics as logic. He could not have expressed his metaphysics as epistemology, for its work culminates in and is lost in the activity of logic; but epistemology has made possible the expression of metaphysics as logic.

The following master's thesis was accepted during the year by the Department:

JANE ROSS. The Logic of the Spiritual Process. (Under the direction of H. H. WILLIAMS.)

This thesis attempts to meet the fundamental issue: the question of what human nature essentially is. The answer proposed is Spirit. Such a philosophy is presented in response to the need of the present generation for a more satisfying solution than is being given. The evidences of this need are set forth. It is shown that spirituality is the only adequate solution.

The problem is an individual one; so spirit is presented as being a concept of organic personality. The development of spiritual individuality, unfolding as a logical process through many stages forms the core of the concept itself. The character of the spiritual life, its value, meaning, and aims are presented. The origin of the idea and its varying significations throughout history are traced. Finally, the concept of spirit is appraised in relation to modern life. The consequences and practical results of a philosophy of spirit are shown in conclusion.

DEPARTMENT OF PHYSICS

ARTHUR E. RUARK published the following:

Outlines of Atomic Physics, Second Edition, ix, 414 pp., John Wiley and Sons, New York. (With members of the Physics Staff of the University of Pittsburgh and the University of Toledo.)

The Distribution in Time of Counts Due to a Constant Source and Its Daughter in Equilibrium. *Physical Review,* LI: 710. 1937. (With LEE DEVOL.)

The Efficiency of Counters and Counter Circuits. *Physical Review,* LII: 322. 1937. (With FOREST E. BRAMMER.)

PROFESSOR RUARK has the following research and writing in progress:

Automatic Devices for Studying the Time-Distribution of Counts. (With R. L. DRISCOLL.)

Second Edition of *Atoms, Molecules and Quanta,* with HAROLD C. UREY.

He is directing the following researches:

C. C. JONES. Cloud Chamber Studies of Positrons and Electrons Produced by Cosmic Rays and Gamma Rays.

MARY W. HODGE. Studies of the Statistics of Counting Devices.

OTTO STUHLMAN, JR., has completed the following investigations:

The Physical Constants of the Ossicles of the Human Ear. (Read before the American Physical Society, Chapel Hill-Durham meeting, February, 1937.)

Data represent mean values from nine complete sets of human ossicles. Experimental data obtained from 26X models made from the average data indicated. Malleus: mass 22.9 mg. Over-all length 8.5 to 9.00 mm, from end of lateral process to end of manubrium 5.5 to 6.00 mm, angle between head and manubrium 145°, angle between head and lateral process 70°. Center of gravity in neck at corda tympani. Tensor tympani attached just below this point, lever arm to center of gravity 1.00 mm, manubrium lever arm 6.5 mm. Angle between axes of head and manubrium 145°, lateral process and manubrium 70°. Incus: mass 27.4 mg. Over-all height along axis of long crus 7.0 mm, at right angles from short crus to facet 5.0 mm, height of facet 3.5 mm. Axis of short crus set at 35° to axis of long crus. Angle between long and short crus 85° to 90°. Center of gravity 5.0 mm above lenticular process to center of articulation facet. Stapes: mass 3.5 mg. Over-all vertical height to foot plate 4.00 mm. Foot plate, length 3.2 mm, width at middle 1.4 mm. Area 3.2 sq. mm. Posterior crus compression member, anterior crus tension member for hinged vibration around posterior end of foot plate. Resultant tension supplied by stapedius muscle. Superior arch Gothic, inferior arch parabolic. Gothic arch tension, parabolic arch compression for hinged vibration around inferior edge of foot plate.

Cross sections through crura U-shaped. Fenestra ovalis to fenestra rotunda areas ratio 3 to 2. Conical depression at center of membrana tympani subtends 135°.

A Physical Analysis of the Dead Beat Mechanism of the Auditory Ossicles. (Read before the American Physical Society, Washington meeting, April, 1937.)

The Dynamics of the Auditory Ossicles. (Read before the Acoustical Society of America, Washington meeting, May, 1937.)

The Non-Linear Transmission Characteristics of the Auditory Ossicles. In print. *Journal of the Acoustical Society of America.*

PROFESSOR STUHLMAN has the following studies under way:

Selective Radio Frequency Absorption in Gases.

The Bio-physical Significance of the Basilar Membrane in the Human Ear.

The Structural Significance of the Stapes of the Human Ear.

E. K. PLYLER has continued the Infrared Study of the Absorption Spectra of Organic Liquids. He has published during the past year (with DR. F. D. WILLIAMS) the following research:

The Infrared Absorption of Heavy Acids and Bases in Solution. *Journal of the American Chemical Society,* LIX: 56. 1937.

He has completed researches on the Infrared Absorption Spectra of Inorganic Aqueous Solutions. This work is to be published shortly.

PROFESSOR PLYLER is continuing his researches on Molecular Structure and the Interaction Between Molecules of Different Types in Mixtures.

MR. JAMES W. WHITE is studying, under PROFESSOR PLYLER'S direction, the Effect of Water Upon Long Wave-Length Spectra of Organic Liquids.

MR. GEORGE CROUCH is making a Study of the Interaction of Different Types of Polar Molecules as Shown by Their Spectra. This work is being done under PROFESSOR PLYLER'S direction.

DR. F. D. WILLIAMS continued his researches in the laboratory during the summer of 1937, and has published the following paper:

The Infrared Absorption of Mixtures of Methyl Alcohol with Ethyl Formate and with Ethyl Acetate. *Journal of the American Chemical Society,* LIX: 817. 1937.

DR. WALTER GORDY has continued his researches in the physics laboratory and has published the following papers during the past year:

The Infrared Absorption Spectra of Dioxane-Water Mixtures. *Journal of Chemical Physics,* IV: 769. 1936.

The Infrared Absorption of Alcohol-Acetone Mixtures. *Physical Review,* L: 1151. 1936.

The Infrared Absorption Spectra of Certain Liquid Mixtures. *Journal of the American Chemical Society,* LIX: 464. 1937.

Effects of Certain Liquids on the OH Vibrational Band of Alcohol. *Physical Review,* LI: 564. 1937.

The Infrared Absorption of Various Solutions of Acetic Acid. *Journal of Chemical Physics,* V: 284. 1937.

The Infrared Absorption of Mixtures of Methyl Alcohol with Ethyl Formate and with Ethyl Acetate. *Journal of the American Chemical Society,* LIX: 817. 1937. (With F. D. WILLIAMS.)

PAUL E. SHEARIN has the following research in progress:

The Energy Levels of Nuclei Between Oxygen and Calcium.

Measurement of Low Voltages.

The Influence of Water on the Far-Infrared Spectra of the Alcohols.

A Comparison of the Liquid and Vapor States of Some Organic Compounds by Means of Their Infrared Spectra.

JOHN A. WHEELER has the following papers in press, to appear in *The Physical Review* about December 1, 1937:

Molecular Viewpoint in Nuclear Structure, 67 pp.

On the Mathematical Description of Light Nuclei by the Method of Resonating Group Structure, 39 pp.

Wave Function for Large Arguments by the Amplitude-Phase Method, 11 pp.

A preliminary account of the Method of Resonating Group Structure was presented to the Chapel Hill-Durham meeting of The American Physical Society, February, 1937, and is published in brief form in *The Physical Review,* LXI: 683. 1937.

Application of this method to the Interaction Between Two Deuterons has been made by MR. HERMON PARKER. He gave a preliminary account of this at the February meeting of The American Physical Society (*The Physical Review,* LXI: 683. 1937), and has given a detailed treatment of the problem in his master's thesis, University of North Carolina, June, 1937. MR. PARKER is at present extending this work in order to treat the problem of the Disintegration of Deuterons into Neutrons and Protons.

MISS KATHARINE WAY is applying the Method of Resonating Group Structure to the Interaction of Protons and Neutrons with Alpha Particles. Miss Way completed her doctoral dissertation during the summer of 1937, the subject being: Photoelectric Disintegration of the Deuteron. This work is published under the title: Photoelectric Cross Section of the Deuteron. *The Physical Review,* LXI: 552. 1937.

MR. C. V. CANNON is working with PROFESSOR WHEELER on the Rotation of Molecules in Solid N_2O.

PROFESSOR WHEELER has the following research in progress:

The Theory of Electrons and Positrons.

The Creation of Triples by Gamma Rays.

The Relationship of Nuclear Forces to Electron Theory.

The following master's theses were completed during the year under the direction of the Department:

HENRY GRADY DORSETT, JR. Infrared Absorption of Certain Strong and Weak Acids in Aqueous Solutions. (Under the direction of E. K. PLYLER.)

This investigation was concerned with the effects produced in the absorption spectra of certain acids in aqueous solution by changes in concentration of the acids. Propionic acid and two of its chlorine-substituted products, α- and β-chloropropionic acids, were chosen for this work because their hydrogen ion concentrations are in the approximate ratio of 1:6:105. Using the same cell thickness, the absorption spectra of water and 2N, 4N, 6N and 8N concentrations of each acid were obtained. When the water

curve was plotted to the same scale as each of the acid curves, the effect of increasing strength of acid was readily apparent. It was also observed that the weak acids showed greatest absorption in the region of 5.8μ but did not differ much from water absorption in the region from 4.5μ to 5.5μ. The α-chloropropionic acid, the strongest acid studied, showed strong absorption in the region of 5.8μ and also strong absorption from 4.5μ to 5.5μ. These two regions of strong absorption could readily be used for the detection of strong acids. Since the cells are only about 0.01 mm. in thickness, however, quantitative measurements cannot be made.

HERMON MANLEY PARKER. Stable States of Two Deuterons. (Under the direction of JOHN A. WHEELER.)

The nuclear four-body problem is treated by a method applicable to both positive and negative energy states. Since the alpha particle may be regarded as being composed of two deuterons, it is a reasonable approximation to use a trial wave function consisting of the product of the internal wave functions of two deuterons and an unknown parametric function U dependent upon the separation of the two deuterons. U is determined by minimizing the average energy according to the variation method.

The binding energy and wave function for the ground state are calculated and compared with the binding energy and wave function obtained by previous workers employing a simple two-parameter wave function of an exponential form. The same nuclear forces are used in the two methods when making the comparison. The agreement is satisfactory. No evidence for excited stable levels is found.

It is concluded that the application of the Reasonating Group Structure Method to the helium nucleus, with the inclusion of terms in the wave function corresponding to the other possible groupings of the particles, should further improve the accuracy of the quantum mechanical description of the ^{4}He nucleus.

DEPARTMENT OF PHYSIOLOGY

H. WARD FERRILL has the following research in progress:

The Effect of Insulin on Growth When Applied to Successive Generations.

The Effect of Repeated Injections of Insulin on the Histology of the Pancreas.

DEPARTMENT OF POLITICAL SCIENCE

W. W. PIERSON has in preparation, for publication within the year, a monograph on The *Intendencia* of Venezuela.

WILLIAM S. JENKINS, on leave of absence during the fall quarter, is bringing to a conclusion his studies in preparation of a volume on the Amending Process.

JAMES W. FESLER contributed the study, Executive Management and Federal Field Service (pp. 271-294), in Part II of the report of *The President's Committee on Administrative Management.* Washington: United States Government Printing Office. 1937.

PROFESSOR FESLER is on leave of absence, during the academic year 1937-1938, to undertake an investigation of state regulative commissions.

CHARLTON F. CHUTE has published the following book review:

Charles F. Roos, *N. R. A. Economic Planning. The Southern Economic Journal,* 1937.

PROFESSOR CHUTE has the following research in progress:

Coöperative Governmental Purchasing in the Irish Free State.

Some Neglected Aspects of the Federal Police Power.

The Federal Emergency Administration of Public Works.

ELWYN A. MAUCK has published:

Financial Control in the Suburban Areas of New York State. Albany, N. Y.: J. B. Lyon Company. 1937. (Published also as the *Tenth Report of the New York State Commission for the Revision of the Tax Laws.* Albany, N. Y.)

This report and doctoral dissertation (Columbia University 1937) demonstrates the need for administrative reform in the suburban areas of New York State. The criteria adopted by the author relate to the financial structure and operations of the numerous overlapping units of government. These criteria include the tax and special assessment burden considered in relation to value of taxable property, the extent of tax delinquency, tax compromise and foreclosure of tax liens, and lastly, bonding policies, extent of public indebtedness and the burden of debt service. The criteria chosen represent the very foundations upon which local governmental services are based, and the weaknesses revealed by the study demonstrate the precarious position of such services.

Recommendations of the author include:

(1) Enactment of laws permitting wide choice in optional forms of local government. This constitutes a first step toward home rule for metropolitan areas, but is advisable only if the option is exercised to promote simplification of structure, economy or efficiency.

(2) Establishment of governmental machinery to exercise strict control over the subdivision of land and to prevent premature development of suburban properties.

(3) Statutory limitation and adminstrative control of public indebtedness, with particular regard to the overlapping feature of debt-incurring units.

(4) Organization of procedures to solve urgent problems of overindebtedness and extensive tax delinquency.

The findings and recommendations are supported by numerous tables, charts, and maps.

Progress on the following theses and dissertations is reported:

W. N. RAIRIGH. (Master's thesis.) Common Law in Maryland during the Colonial Period. (Under the direction of E. J. WOODHOUSE.)

F. J. BARNES. (Doctoral dissertation.) The City in Virginia. (Under the direction of E. J. WOODHOUSE.)

E. C. GASS. (Doctoral dissertation.) Constitutional Aspects of Federal Bankruptcy Legislation. (Under the direction of W. S. JENKINS and J. W. FESLER.)

H. B. HOWERTON. (Doctoral dissertation.) Constitutional History of Mississippi. (Under the direction of W. S. JENKINS.)

DEPARTMENT OF PSYCHOLOGY

J. F. DASHIELL has published:

Fundamentals of General Psychology. New York: Houghton-Mifflin Company. April, 1937. 655 pages, 153 illustrations.

Manual to accompany the above-mentioned book. 117 pages, with illustrations. New York: Houghton-Mifflin Company. July, 1937.

PROFESSOR DASHIELL has completed the following:

Affective Value-Distances as a Determinant of Esthetic Judgment-Times (with the assistance of SYBILLE BERWANGER). *American Journal of Psychology,* to appear in special Jubilee Volume.

"Learning," a chapter for the *Yearbook* of the National Society for the Study of Education, being a review of scientific achievements in the field of learning during the last decade.

"Psychology," a chapter for the book, *On Going to College.* Oxford University Press.

PROFESSOR DASHIELL has continued as editor of the series, *Publications in Psychology.* New York: McGraw-Hill Book Company. Three books have been added to the series during the year.

He has continued as editor of *Psychological Monographs,* one of the six official journals of the American Psychological Association. Two volumes of monographs have been prepared during the year.

He has continued as an associate editor of the *Journal of Psychology.*

R. J. WHERRY has completed work on the following studies:

An Extension of the Doolittle Method.

This extension permits finding $r_{o.12\ldots n}$, $S_{o.12\ldots n}$, or $\Sigma\, e^2_{o.12\ldots n}$ without solving for the regression weights depending upon whether r's, p's, or gross scores are used in the solution.

Two Methods of Estimating Beta Weights.

Two methods of estimating regression coefficients for z-scores are proposed. The simpler, based upon the criterion correlation and the average intercorrelation coefficient for each variable, is derived by generalization from the determinant form. The more complex method, based upon actual expansions, involves the criterion and three types of average intercorrelations. Examples are given.

The Shrinkage of the Spearman-Brown Formula in Predicting Validity.

Applies the Wherry shrinkage formula and by partial differentiation secures the maximizing function. Short table given, and examples illustrating various uses.

The Standard Errors of the Regression Weights.

Reviews two methods presented in the literature (Horst and Ezekeal) and revives a method suggested by Merriman. Formulae (in modern statistical notation) given for two, three, and four variables, so that values can be derived directly from Doolittle solution.

On the Systematic Fitting of Second Degree Lines of Trend by Stencil and Calculating Machine.

Method of obtaining constants a, b, and c in the equation $Y=a+bX+cX^2$, when the abscissal values are equally spaced. Tables for values up to twelve plotting points, and equations for extension of the method.

The Use of the Doolittle Method in Simple Regression.

Surveys the argument of gross scores versus derived coefficients. Shows how the mean, standard deviations, standard error of estimate, correlation coefficient, and regression weights can all be secured from a single Doolittle solution using gross scores. [Note: This method will also be extended to problems of multiple correlation.]

R. J. WHERRY has in progress the following studies:

Prediction. A book giving a comprehensive survey of the treatment of multi-variable prediction. (In collaboration with DR. H. A. TOOPS, Ohio State University.)

Reduces all possible methods to common notation. Gives weaknesses and advantages of each method. A common example (based on Minnesota Mechanical Aptitudes data) is solved by each method. Includes theoretical discussions, derivatives, and tables. Includes several new techniques of the authors.

Modification of a "Tropism" in Lumbricus Terrestris. (In collaboration with JAMES M. SANDERS, Oklahoma Baptist University.)

A study of the ability of Lumbricus Terrestris, normally negatively phototropic, to learn to choose the lighted arm of a T-maze. Results appear to be positive.

Maximum Prediction with a Minimum Number of Variables:

I. An iteration method of test selection.

Permits approximation to maximally predictive batteries of 2, 3, . . . , n tests. Based upon a modification of Kelley-Sallisbury method.

II. An exact method of test selection.

Permits exact selection of maximally predictive batteries of 2, 3, . . . , n tests. Based upon Doolittle method and Wherry extension. [Now in use in Occupational Research Division of U. S. Employment Service.]

A. G. BAYROFF has completed a set of objective quizzes for Professor Dashiell's *Fundamentals of General Psychology.* The quizzes are being published by Houghton-Mifflin Company.

He is continuing the study of the experimental social behaviour of animals. The present research concerns the relationship between the social nature of the early life and the dominance over other animals during adulthood. Young white rats are being reared in isolation, and a swimming tank is being developed for use as the test.

ALBERT C. CORNSWEET read the following paper before Section I of the American Association for the Advancement of Science, December, 1936:

Recovery Sequence After Ether Anesthetization. (Under the direction of J. F. DASHIELL.)

Upon recovering from etherization, white rats exhibit a definite and marked progression in a cephalo-caudad direction in the reappearance of their normal behavioral tendencies, especially their motor responses to direct cutaneous stimulation.

Preparations are being made for extending the work with the use of cyclopropane, nitrous oxide, and evipal as anesthesias, with oxygen and carbon dioxide as controls.

MILDRED MENDENHALL is studying the Effects of Sodium Phenobarbital on the Learning and Rational Activity of the Albino Rat. (Under the direction of J. F. DASHIELL.)

Rats given injections of sodium phenobarbital every 48 hours for six months, followed by a recovery period of six weeks, show a significant inferiority to paired control animals in learning a 24-unit elevated maze.

A further comparison is to be made between the drugged and the control rats in a "reasoning" problem.

HALSEY M. MACPHEE is studying Selection and Elimination in Learning a Punch Board Maze with Shock, Buzzer, and No Signal. (Under the direction of J. F. DASHIELL.)

Each subject is given a maze to learn, consisting of twenty groups of holes, in three-hole groups. In each group contact with the different holes produces an electric shock, a buzzer sound, or no signal, respectively. Some subjects learn the "shock" holes as the correct ones, some, the buzzer holes, and some, the no-signal holes. The data being gathered may throw critical light upon laws of learning, especially the law of effect.

The following doctoral dissertation was accepted by the Department during the year:

DELOS DONALD WICKENS. The Transference of Conditioned Excitation and Conditioned Inhibition from One Muscle Group to the Antagonistic Muscle Group. (Under the direction of J. F. DASHIELL.)

After conditioning an extensor withdrawal movement of the middle finger to the sound of a buzzer, the hand was turned over so that a flexor move-

ment was now necessary to remove the finger from the electrode, and the buzzer only was sounded. Ten of the eighteen subjects showed immediate transference of the conditioned response, while the others were conditioned to make this new movement after a number of reinforcements that was considerably less than that necessary to establish the extensor response. Following this the hand was turned back to the palm-down position to determine whether or not the extensor response was still present.

A control group was given 190 shocks alone in the palm-down position, then the hand was turned over to see if they would respond to the buzzer alone in this position. Only two of the fourteen subjects did so, and the remaining subjects were conditioned to make the flexor response after a number of reinforcements that was considerably greater than was required to condition the flexor response in the subjects in the experimental group who did not show immediate transference.

Some of the experimental subjects were brought back for a second experiment in which the extensor response was reconditioned, and immediately afterwards the flexor response was extinguished. The hand was then turned back to the palm-down position and the buzzer alone was sounded. It was found that extinguishing the flexor response served also to extinguish the extensor response.

Theories of conditioning were then examined, and it was found that the results were completely incompatible with the stimulus-substitution explanation of conditioning. Other theories that were suitable for explaining the main results of this experiment were rejected because they failed to account for other phenomena of conditioning. No theory is offered to explain the results of the experiment, but the adaptive nature of the conditioned response is emphasized.

DIVISION OF PUBLIC HEALTH

HERMAN G. BAITY has submitted for publication:

Some Factors Affecting the Aerobic Decomposition of Sewage Sludge Deposits. Presented as a paper before The North Carolina Sewage Works Association, August 27, 1937.

This study is concerned with the factors influencing the decomposition of sewage sludge deposits in fresh and saline waters and their effects upon the chemical and biological quality of the supernatant streams. Phases of the problem which have been investigated and reported upon comprise: (a) The total biochemical oxygen demand of sludge, the rate of demand and the time required for aerobic stabilization. (b) The effect of oxygen concentration in the supernatant water upon the rate of oxygen demand of sludge banks. (c) The effect of the depth of the sludge deposit upon the rate of oxygen requirement. (d) The critical depth to which aerobic activity is maintained. (e) The direct effect of sunlight upon the organisms

of aerobic decomposition, and its indirect effect upon the oxygen content of polluted stream water through the agency of chlorophyll-producing organisms. (f) The effect of temperature upon the rate of aerobic stabilization of pollutional deposits. (g) The effect of salinity of the supernatant water upon the rate of oxygen demand of sludge banks. (h) The character and changes of the bacterial and protozoan life in sludges digested under different conditions of oxygen supply, sludge depth, light, temperature, and salinity.

The results should be of general and practical application in determining the pollutional capacity of streams and should provide reliable criteria for estimating the effects of the various factors operative in the decomposition of the organic carpets of sewage solids laid down on their beds.

PROFESSOR BAITY, with MESSRS. L. B. HALL and J. A. WESTBROOK, has conducted the following research:

Studies of Some Factors Affecting the Dewatering of Digested Sewage on Sand Beds.

These investigations, conducted over a cycle of seasonal variations, were designed to evaluate the following factors which affect the filtration and drying of digested sludge on sand beds, as ordinarily practised in connection with sewage treatment processes: (a) Sunlight (b) Temperature (c) Humidity of atmosphere (d) Air movement (e) Rainfall (f) Size of sand grains (g) Depth and arrangement of filtering medium (h) Depth of applied sludge (i) Glass covers over sludge beds and (j) Degree of digestion of sludge.

These studies are being continued and expanded during 1937-1938.

PROFESSOR BAITY and ASSISTANT PROFESSOR JOHN C. GEYER have directed the following research:

HENRY J. MILES and RALPH PORGES. The Treatment and Recovery of Textile Wastes.

Under a grant from the Textile Foundation, Inc., there has been maintained at Greensboro, North Carolina, for the past four years, a field research station for the study of the complex problems involved in the treatment of the many wastes arising from textile processing. This station is equipped with pilot plants capable of providing any known method of physical, chemical or biological treatment of individual wastes, waste mixtures or combinations of industrial and domestic wastes, and is provided with a complete control laboratory. Several published articles have reported the progress of these investigations.

During the past year two full-time research assistants have been engaged in the phase of the study relating to the activated sludge treatment of the most troublesome wastes in combination with domestic sewage. The results

of this work indicate the feasibility of such treatment methods, and appear to be of great practical value to the textile industry and stream conservationists.

The studies which are being continued during the current year under the direction of PROFESSORS BAITY and HAROLD B. GOTAAS, with three full-time research assistants on duty, will be concerned with other biological processes and chemical precipitation methods.

HAROLD B. GOTAAS has the following research in progress:

An Investigation of Methods for the Control of Algal Growths on Walls of Swimming Pools.

Studies are being made to determine the possible use and effectiveness of certain chemicals in concrete or paint in preventing algal growths.

DEPARTMENT OF ROMANCE LANGUAGES

WILLIAM M. DEY has continued his work on Stendhal and his contemporaries, and he is also engaged upon several problems connected with *Les Destinées* of Alfred de Vigny.

PROFESSOR DEY is directing the following research:

J. A. DOWNS. (Progress on doctoral dissertation.) The Development of Lyric Poetry in France, 1790-1820.

STURGIS E. LEAVITT has published:

Theses dealing with Hispano-American Language and Literature. *Hispania,* XX: 174-176. 1937.

Spanish American Literature: The National Period. *Handbook of Latin American Studies.* Cambridge: Harvard University Press. 1936, pp. 196-209.

He continues as editor of the *South Atlantic Bulletin* and as contributing editor to the *Handbook of Latin American Studies.*

He is working on a bibliography of biography and literary criticism in Spanish America; a study of the *comedia de figurón* in Spain; the *tradición* in Spanish America.

PROFESSOR LEAVITT is directing the following research:

L. L. BARRETT. The Rôle of the Supernatural in the Non-Religious Drama of the *Siglo de Oro.*

J. A. BARRETT. Some Aspects of the Dramatic Art of Rojas Zorrilla.

U. T. HOLMES, JR., has published the following:

Provençal 'huelh de veire' and 'sec . . . son agre.' *Modern Language Notes,* LII: 264-265. March, 1937.

Chaucer's *Tydif,* "A Small Bird." *Philological Quarterly,* XVI: 65-77. January, 1937.

(With W. M. MCLEOD.) Source Problems of the *Chetifs. Romanic Review,* XXVIII: 99-108. March, 1937.

A History of Old French Literature. Chapel Hill and New York: R. W. Linker and F. S. Crofts. 1937.

The article, Portuguese-Americans in F. J. Brown and C. Roucek's *Our Racial and National Minorities.* New York: Prentice-Hall. 1937.

He has the following in press:

Old French *esterminals,* to appear shortly in *Speculum.*

Med. Latin *mancus,* O. French *mangon,* to be published in the March, 1938, issue of *Publications of Modern Language Association.*

(With J. C. LYONS, R. W. LINKER.) *The Works of Du Bartas,* Vol. II. Chapel Hill: The University of North Carolina Press. To appear about January, 1938.

He is preparing an edition of the Old French epic *Berthe aus grans pies* to be issued in the *Classiques français du Moyen Age* series (Paris, France).

During 1937 PROFESSOR HOLMES has been named an advisory editor of *Speculum* and also honorary secretary for America of the Anglo-Norman Text Society.

PROFESSOR HOLMES is directing the following research:

G. C. S. ADAMS. A Study of the Variants of *Domina* and *Femina* in the French and Provençal Dialects. (Progress on doctoral dissertation.)

C. M. WOODARD. The Variants of *Caballus* and *Equus* in the French and Provençal Dialects. (Progress on doctoral dissertation.)

E. D. HEALY. A Study of the Origins of the Old French Romance. (Progress on doctoral dissertation.)

W. B. NAPIER. Literary Patronage at the Medieval Court of Hainaut. (Progress on doctoral dissertation.)

CAREY DEWITT ELDRIDGE. Literary Patronage at the Court of Champagne. (Progress on doctoral dissertation.)

SAPELO TREANOR. An Edition of the Old French *Sydrac.* (Progress on doctoral dissertation.)

E. F. MOYER. The *Merveilleux* Element in the Old French Romance. (Progress on doctoral dissertation.)

R. D. WHICHARD. An Investigation of the Possible Celtic Influence on Old French Syntax, Morphology, and Phonology. (Progress on master's thesis.)

During the year PROFESSOR HOLMES has contributed some two dozen reviews to *Books Abroad.*

NICHOLSON B. ADAMS has published:

Notes on Espronceda's *Sancho Saldana. Hispanic Review,* V: 304-308. 1937.

PROFESSOR ADAMS is continuing his studies in Spanish Romanticism.

H. R. HUSE has completed a study on Anatole France. He is working at present on the psychology of foreign language study.

R. S. BOGGS has published:

Survival of Three-Consonant Groups in Spanish. *Hispanic Review,* V: 268-269. July, 1937.

A three-consonant group, in order to survive unchanged, must have an audibility pattern of high-low-high. A three-consonant group, having two members of low audibility, drops the first of these two.

He has made his annual folklore bibliographies for *Volkskundliche Bibliographie, PMLA,* and *Handbook of Latin American Studies.*

He is continuing the Old Spanish Dictionary and Spanish Bibliography projects; also, with F. C. HAYES, the Spanish Proverb project.

He is preparing for publication the Spanish folklore gathered in Florida in June, 1936, and a Spanish Phonology.

He is directing the doctoral dissertation of T. E. WRIGHT:

An Index of French Folktales.

W. L. WILEY has published:

The French Renaissance Gallicized: An Emphasis on National Tradition. *Studies in Philology,* XXXIV: 2. April, 1937.

He is continuing his work on the literary theories of Charles Fontaine.

F. C. HAYES has published:

The Collecting of Proverbs in Spain before 1650. *Hispania,* XX: 85-94. 1937.

The Use of Proverbs in the Golden Age Drama: Lope de Vega. (First of a series of articles accepted by the *Hispanic Review,* University of Pennsylvania.)

DR. HAYES is continuing work on the *Diccionario Histórico de los Refranes Españoles* with the aid of the N. Y. A. (In collaboration with R. S. BOGGS.)

W. R. WEAVER is working on:

A Tentative Code Index to the *Siglo de Oro Comedia.* (With L. L. BARRETT.)

L. L. BARRETT has completed *A Medieval Italian Anthology.* (With R. W. LINKER.)

He has in progress:

A Tentative Code Index to the *Siglo de Oro Comedia.* (With W. R. WEAVER.)

The following doctoral dissertations were accepted by the Department during the year:

DAVID ETHAN FRIERSON. A Historical Study of the Language of Venice XIII, Franco-Italian Manuscript of the Fourteenth Century. (Under the direction of U. T. HOLMES, JR.)

Franco-Italian was an artificial literary language widespread over Northern Italy during the thirteenth and fourteenth centuries. It was used as a medium for rendering the Old French *chansons de geste* understandable to Italian audiences. A great many manuscripts have come down to us in Franco-Italian, all showing varying degrees of hybridism. The language of Venice XIII, however, is the only one in which there is present a tendency to fuse almost equal proportions of French and Italian into a new idiom. Despite the barbarous appearance of the language, its phonological development resolves itself into rules in a very harmonious manner, so much so that one wonders how any one such as our anonymous author, 500 years before the advent of scientific linguistics, could have been so acutely aware of the innate parallelism between Old French and Old Italian. It has been the subject of much speculation since the discovery of the manuscript seventy-five years ago.

Chapter I of this dissertation, the Introduction, contains a description of the manuscript, a brief account of French language and literature in Italy during the Middle Ages, various generalizations about the language of Venice XIII, and a consideration of certain theories that have been advanced to explain its origin.

Chapter II, the Phonology, is an attempt to establish rules by which Vulgar Latin sounds developed into Franco-Italian, sometimes going through the intermediary stages of Old French or Old Italian, sometimes evolving along an entirely independent line.

Chapter III, the Morphology, is a history of the noun, pronoun, and verb forms. Among the many verb forms of bizarre appearance, two deserve special attention: an interesting and exceedingly rare "double divided" future, composed of the future of the verb *avoir*, "to have", plus the infinitive, and an analytical subjunctive, apparently unique in this manuscript, composed of the present subjunctive of the verb *dever*, "ought", plus the infinitive.

The Glossary contains over 5,000 words and forms, with line references and definitions. In this part of the dissertation the statistical material presented in Chapters II and III has made it possible to correct numerous bad readings in previously edited portions of the manuscript, and to establish etyma for a number of words of hitherto unknown or unexplained origin.

John Archie Thompson. Alexandre Dumas and the Romantic Drama in Spain, 1830-1850. (Under the direction of Nicholson B. Adams.)

The purpose of this dissertation is to contribute to a hitherto neglected chapter of the history of Romanticism in Spain: the large part that Alexandre Dumas (*père*) had in determining the course of Spanish drama from 1834 to 1850.

The otherwise excellent studies of Dumas by Hippolyte Parigot fail to give a satisfactory treatment of those phases of his subject-matter and dramatic style that most affected the drama in Spain. The first chapter of this study attempts briefly to supply that lack.

The second chapter presents careful analyses of: the many Spanish translations of Dumas' plays made before 1850, discussed chronologically, and the estimates of Dumas by Spanish critics, also arranged chronologically. It was discovered that in a few cases the translators made changes to improve the original plays, but that in a far larger number of instances the alterations were made for the purpose of eliminating blasphemous oaths and scenes of violence, indecorum or anti-social tendency. Prohibition by the censorship of several plays shows that the modifications were well advised.

Critical reactions in Spain to Dumas' plays ranged in the 1830's from the most enthusiastic partisanship to bitter denunciation. During the follow-

ing decade, although critics continued to be divided in their attitude toward the elder Dumas, they were less violent in the expression of opinion. This development parallels, and may be caused by, the trend in the plays themselves; or the lessening of acrimony may be due to indifference brought about by familiarization.

The third chapter discusses the influence of Dumas on the original romantic plays written in Spain. Some plays, such as *El Bufón del Rey*, *Los Pasteles de María Michón* and *Benvenuto Cellini*, mere dramatizations of Dumas' novels, show complete subservience to their models. Others, such as *El Paje* and *Don Juan Tenorio*, although obviously drawing subject matter or inspiration from dramas of Dumas, are less slavish in their imitation. Finally, a large number of instances have been found of the use of subject matter, characters, mood, and technique characteristic of Dumas, but which quite conceivably could be original creations or borrowings from other sources. In view of the fact that critics frequently expressed the opinion that Dumas was the most skillful dramatic technician of the century, however, it is logical to assume that inept playwrights turned to him for guidance.

Appended to the dissertation is a list of Spanish translations of Dumas' plays and another of his non-dramatic works appearing in translation in Spain.

WILLIAM ROWE WEAVER. An Introductory Study of Stage Devices in the *Siglo de Oro* Drama. (Under the direction of S. E. LEAVITT.)

This thesis is an introductory study of the devices employed in over one thousand *comedias* of the *Siglo de Oro*, beginning with Cervantes and running through Calderón and his contemporaries. Private or court performances have not been considered, since they seemed unrepresentative of normal production methods. The study has been restricted, consequently, to plays clearly designed for commercial presentation. In these plays the stage directions were examined, and the appearance of equipment mentioned therein was listed.

The devices noted have been divided into three major groups: those concerned with the physical features of the stage proper; those consisting of mobile accessories; and those utilizing general staging practises of a material or external nature. The text of the thesis presents a brief analysis of the individual devices, classified in subsections within the three primary divisions. *Appendix A* contains a list of these devices, alphabetically arranged by plays; and *Appendix B* is an index of the code symbols employed to identify the plays.

The variety of devices noted shows that staging methods in the Golden Age were not so impoverished as critics have thought. The physical simplicity of the normal stage and the absence of a front curtain seem to have been offset by a frequent usage of disclosure scenes, in which curtains

were employed to conceal recessed areas within which sets could be prepared in advance and revealed at appropriate moments. Such scenes, often meticulously described in the stage directions, could be multiple in character, presenting more than one disclosure at the same time or utilizing a curtain-within-a-curtain technique, with the added possibility of arranging various disclosures on different levels. These disclosure scenes afforded increased elasticity in staging practises, and by means of their detailed furnishings became colorful tableaux, the dramatic effectiveness of which must have been considerable.

A certain amount of realism on the stage itself was obtained through the use of canvas drops, trees, flowers, rocks, platforms, and steps; while machine devices, consisting of movable lifts or fanciful representations of suns, moons, and stars, aided in relieving possible monotony in staging. Mobile accessories were employed in profusion and represented a vast cross-section of everyday articles and implements.

Despite the fact that this study lays no claim to completeness, inasmuch as the overwhelming wealth of material in the Golden-Age drama renders a truly definitive work virtually impossible, it does reveal that the *Siglo de Oro* stage possessed a surprising diversity in production methods. Almost without exception, the stage directions disclose a search on the part of the authors for material devices that would add color, variety, and richness, even though most of the equipment recommended by them was basically inexpensive and easily obtainable. In addition, the playwrights show themselves constantly desirous of presenting spectacular scenes, whose pictorial beauty or frank horror would intrigue the audience, and their choice of furnishings for the stage proper manifests a decided quest for realism.

The following master's theses were accepted by the Department during the year:

ATLAS LAWRENCE CHEEK. The Prose Plays of Victor Hugo in Relation to Historical Fact. (Under the direction of WILLIAM M. DEY.)

This thesis attempts to arrive at definite conclusions concerning the use of history in the prose plays of Victor Hugo, namely, *Lucrèce Borgia*, *Marie Tudor*, and *Angelo*. The introductory chapter explains the origins of Romantic drama and states the rivalry between Hugo and Dumas père as a reason for the composition of these plays in prose.

The three following chapters discuss the plays in general, and present in the form of double columns a detailed comparison of the historical references in the texts with not only those sources cited by the author, but also considerable additional source material.

From this extensive comparison the final chapter or conclusion asserts that although the use of history varies somewhat in the three plays, the author attempts to make use of it in all of them as atmosphere and as a springboard into moral and philosophical declarations.

MABEL BENNER COBB. The Dramatic Work of José María Díaz, with Special Reference to Historical Tragedy. (Under the direction of S. E. LEAVITT.)

The purpose of this study is to arrive at a critical evaluation of the works of José María Díaz, a minor dramatist of the Romantic and Post-Romantic period. The thesis first presents as complete a list of the author's works as could be compiled from all available sources, followed by a brief biography of Díaz. The main study consists of summaries, act by act, of thirteen historical tragedies, each summary being followed by a critical examination of the play with a discussion of its sources, the handling of plot and situation, the dramatic technique, and character development. After the main study a chapter is devoted to a discussion of the other available plays of the author which fall outside the classification of historical tragedy.

The following conclusions have been reached. José María Díaz is a derivative dramatist, who followed the trends of his time. He shows no true dramatic talent in plot construction, or in dramatic technique, or in character development. His moral tone is sound, but conventional and superficial. He is lacking in wit and humor. In taste he is sensational and melodramatic, preferring above all the horrific. He has talent in recognizing and selecting material for his plays but little skill in developing it. He can create interesting single dramatic situations but cannot articulate them satisfactorily with a sustained plot. Among his good qualities are a flair for picturesque stage settings and an ability to write smooth-flowing verse.

CAREY DEWITT ELDRIDGE. Hallucination and the Life and Works of Jean-Arthur Rimbaud. (Under the direction of W. M. DEY.)

This thesis proposes to consider the life and works of Jean-Arthur Rimbaud in relation to his poetic theory which he called *voyance.* It examines the influence of this theory on his own works and on the works of some later poets. In conclusion, it shows how this theory broke with the poetic tradition of Romanticism and still continues today.

ROSALYN HOWARD GARDNER. A Supplement to Beaulieux' *Histoire de l'Orthographe Française:* Punctuation. (Under the direction of URBAN T. HOLMES, JR.)

The purpose of this study is to supplement volume II of Beaulieux' work, which treats accents and other auxiliary signs, such as the cedilla, the hyphen, and the apostrophe. A brief survey of the history of punctuation, from the word-dividers of Old Persian to the modern marks in sixteenth century manuscripts, is followed by a study of the theories and practices in French incunabula and sixteenth century printing. The examination of early printed matter reveals that although the systems of punctuation

varied with the theorists and the printers, there were certain growing tendencies toward uniformity. The paper concludes with an edition of Etienne Dolet's *La maniere de bien traduire d'une langue en aultre, d'advantage de la punctuation de la langue francoyse.*

FRANCIS GHIGO. The Provençal Speech of the Waldensian Colonists of North Carolina. (Under the direction of URBAN T. HOLMES.)

This thesis is primarily a word list containing three variations of the Waldensian dialect. The first was gathered in the Waldensian Valleys in Italy by K. Jaberg and J. Jud to form part of the AIS (*Sprach-und Sachatlas Italiens und der Südschweiz*), which is similar in nature to the *Atlas linguistique de France* of Guilliéron. The remaining two variations were gathered in Valdese, North Carolina.

This word list simply emphasizes the fact that the language of the Waldenses is part of the Modern Provençal group. It also shows that the dialect in Valdese is probably purer than that spoken at the present time by their kinsmen in Italy.

Besides drawing a few rather specific conclusions, the work does not claim to make any exhaustive comparisons among the variations themselves, nor among the adjacent French, Italian and Provençal dialects. It is, however, of permanent value because it records a speech in America which will probably be extinct within the next two generations.

JAMES WOODROW HASSELL, JR. The Erudition and Ideas of N. de Cholières as expressed in his *Matinées.* (Under the direction of J. C. LYONS.)

The purpose of this thesis has been to present the erudition and ideas of Cholières, as he reveals them to us in his *Matinées.* Throughout the thesis we have tried to point out not only the authors, both ancient and contemporary, with whom he was acquainted, but also the ideas in these literary acquaintances of his which were of particular interest to him. From the evidence at hand, we have also tried to show his chief literary limitations.

As for his ideas, we have tried to present them, not only with objective care, but also in comparison with other writers whose ideas were similar to his. At times Cholières shows himself to be a profound and progressive thinker; particularly is this true in regard to his legal ideas, which are discussed with detailed care in the chapter on law. As we would expect, his medical ideas are considerably less advanced, but they are also rather thoroughly discussed in the third chapter in order to show more thoroughly the mind of Cholières at work. As an erudite thinker of the sixteenth century, Cholières presents himself to us as an interesting character, and it is in this light that we have endeavored to study him.

ELLIOTT DOW HEALY. The Views of Ferdinand Lot on the Origins of the Old French Epic. (Under the direction of URBAN T. HOLMES, JR.)

Joseph Bédier's theory explaining the origins of the *chansons de geste* by the collaboration of monks and jongleurs along the pilgrim routes which traversed France during the Middle Ages has been widely accepted. Its application to several important epics has been challenged by Ferdinand Lot, historian and literary critic. An analytical study of Lot's published material on the subject indicates that Bédier's hypothesis suffices to explain the existence of the epic legends with the exception of the oldest, the *Chanson de Roland*, the *Chanson de Guillaume*, and *Gormont et Isembart*. These and certain others whose settings lie far from the pilgrim routes must be explained by the theory of oral or written transmission of early epic material from generation to generation. Not until the immense popularity of the earlier epics had become evident did monasteries and churches interest themselves in the production of *chansons de geste* as an advertising scheme.

RUTH WHARTON KUYKENDALL. A Study of Echegaray's Popularity Through his Dramatic Technique. (Under the direction of S. E. LEAVITT and R. S. BOGGS.)

In this thesis an attempt has been made to arrive, through a study of Echegaray's dramatic technique, at an explanation for his popularity during his lifetime and its subsequent decline. His dramatic technique has been studied as to plot devices, situation devices, and character devices. It has been found that, in a majority of these devices, Echegaray has succeeded in obtaining a spectacular and striking effect. But this effect, because of the extremes and improbabilities to which he resorts to obtain it, could not be lasting. It has been concluded that lack of verisimilitude in his dramatic technique is a prime cause of the decline of Echegaray's popularity. In his dramatic technique, therefore, there is a partial explanation for his popularity during his lifetime and its decline after his death.

WILLIAM ALBERT MCKNIGHT. The Dramatic Works of Antonio Hurtado y Valhondo. (Under the direction of S. E. LEAVITT and R. S. BOGGS.)

Critical material on the dramas of Antonio Hurtado (1825-1878) is almost entirely lacking. This study surveys thirty-three of the author's thirty-nine known dramatic works for the purpose of ascertaining the reason for the decline in the popularity which Hurtado enjoyed during his lifetime, and of determining whether his works merit the obscure position to which critics have relegated them. For study the plays have been grouped as follows: historical dramas, comedies, miscellaneous plays, zarzuelas and one-act plays, collaborations, and translations and adaptations.

Since the author was influential in his time, and since his plays offered substantial rôles for leading actors, they were presented in the best theatres by the best companies of nineteenth-century Spain. When his plays were presented by less competent performers after his death, they lost effective-

ness. Many of his plays were of such types that they declined rapidly in popularity. Although Hurtado consistently shows certain defects as a dramatist, he also shows some permanent values which merit a higher rank for him than that which critics have given him.

Edward Francis Moyer. A Bibliography of Marie de France, with a Brief Consideration of Certain Theories Concerning her Identity. (Under the direction of Urban T. Holmes, Jr.)

This thesis is primarily a bibliography of works dealing with the life and writings of Marie de France. Chapter I takes up in a general way the position occupied by women in the society of the twelfth century. Chapter II examines the various theories of the identity of Marie de France. Chapter III is a discussion of her works.

The bibliography comprises more than two hundred and fifty items, numbered and catalogued, dealing with editions of Marie de France, translations, source studies, literary studies, identifications and chronology, other *lais*, and general works.

Edith Imogene Riddick. Non-Medicinal Plant Lore in Old French Literature. (Under the direction of Urban T. Holmes, Jr.)

Through a study of representative descriptions of Old French gardens, both of an imaginative and a non-imaginative nature, as well as a consideration of the influence of Ancient Greek and Roman and Old English gardens on them, this thesis attempts to disclose the medieval Frenchman's ideas of ornamental gardens with particular emphasis on what trees and plants he grew there. The tree lists in literature correspond closely with those of actual gardens, but for herbs grown it is best to rely on lists of existing gardens. There were many flowers of few varieties.

DEPARTMENT OF RURAL SOCIAL ECONOMICS

S. H. Hobbs, Jr., has edited the University News Letter, which has appeared twenty-five times during the year, each issue being devoted to some economic or social topic of concern to the state.

He is at work on a revision of his book, *North Carolina: Economic and Social.*

He has prepared several reports on local conditions for the North Carolina Rural Electrification Authority, of which he is a member.

He is helping with research in taxation, as a member of the State Tax Classification Commission.

He is preparing a report for the Federal Works Progress Administration on rural social research carried on coöperatively by the Works Progress Administration and the forty-one state units that participated in the rural social research program from 1934 to 1937.

PROFESSOR HOBBS is directing the following research reports:

W. G. BROWDER and H. L. GEISERT. A Survey of Rural Social Research by Types and Agencies.

PAUL W. WAGER continued to serve as Chief of the Land Use Planning Section, Land Utilization Division, Resettlement Administration, Region IV, until September, 1937, although he returned to teach in the winter quarter. Among other activities of the section during the last year has been the completion of four intensive regional surveys, including a recommended land use plan for each area. The four areas surveyed are Overton County, Tennessee; Monongalia County, West Virginia; a part of Ohio County, Kentucky; and Cherokee County, North Carolina. Other agencies participated in each instance, but particularly in the case of Cherokee County, where the survey was a joint undertaking of the Tennessee Valley Authority, the U. S. Forest Service, and the Land Use Planning section of the Resettlement Administration. Mr. Wager was general chairman of the survey committee and editor of the report. None of the four studies has been published, although probably one or more of them will be published by the Bureau of Agricultural Economics.

DEPARTMENT OF SOCIAL WORK

ROY M. BROWN is completing a study of crime in North Carolina, using records in the offices of Superior Court Clerks.

PROFESSOR BROWN is making a study of the development of public welfare in North Carolina.

He directed the master's thesis of KATHARINE LEWIS BARRIER: Seventeen Hundred Economically Handicapped Families: A Study of Families in Orange County, North Carolina, Aided by Federal Emergency Relief. (For abstract, see Department of Sociology.)

W. B. SANDERS (with W. C. EZELL) has published during the year:

Juvenile Court Cases in North Carolina, 1929-1934. Raleigh, N. C.: State Board of Charities and Public Welfare. 1937. 53 pp. 27 tables.

Professor Sanders has begun a follow-up study of six hundred delinquent children released from four training schools for delinquents in North Carolina, July 1, 1926-June 30, 1936.

He is directing the following master's theses:

Kirkwood L. Hanrahan. The History and Administration of the Eastern Carolina Industrial Training School for Boys, Rocky Mount, North Carolina.

Robert K. Bailey. A Follow-up Study in Juvenile Delinquency: The Careers of Eighty-eight Delinquent White Boys Committed to Jackson Training School by the Durham, N. C., Juvenile Court (1922-1935) and their Post-adjustment.

The following master's thesis was completed during the year under the direction of Professor Sanders:

Mamie Rose McGinnis. A Social Analysis of the Delinquent Children Appearing Before the Juvenile Court in Rowan County, North Carolina, July 1, 1929-June 30, 1934.

Since the juvenile court data were so meagre, supplementary information regarding the delinquents' families and their social environment was secured from other social agencies in the community. The social data presented in this study represent, therefore, all available recorded information in Rowan County about the delinquents and their families during the summer of 1936.

The social data included the following information about the delinquents: race, sex and age, composition of the family, marital status of the parents, occupation of the chief bread-winner, relief record, home ownership, number of rooms in the home, grade reached in school by the parents, number of siblings, order of birth of delinquent, number of associates in delinquency, number of appearances before the juvenile court, court records of the parents, type of offenses committed by parents, and court records of the siblings.

Katharine Jocher

See Institute for Research in Social Science.

Ernest R. Groves

See Institute for Research in Social Science.

George H. Lawrence is working on a study of the practice of public welfare in the counties of North Carolina.

DEPARTMENT OF SOCIOLOGY

HOWARD W. ODUM has published during the year:

The Implications of Radio as a Social and Educational Force. A paper read before the First National Conference on Educational Broadcasting, Washington, D. C., December 11, 1936. *Educational Broadcasting,* 1936, pp. 90-109. Edited by C. S. Marsh. Chicago: The University of Chicago Press, 1937. Also printed in *The Educational Record* for January, 1937.

The Errors of Sociology. *Social Forces,* **15**: 327-342. May, 1937.

Notes on the Technicways in Contemporary Society. A paper prepared for the Annual Meeting of the American Sociological Society, Chicago, December 30, 1936. *American Sociological Review,* **2**: 336-346. June, 1937.

Industrial Relations and the Social and Economic Life of the South. *New Factors in Industrial Relations.* (A summary of the Eighteenth Annual Industrial Conference, Blue Ridge, North Carolina, July 15-17, 1937), pp. 67-74.

PROFESSOR ODUM prepared and presented the following papers:

Regional Approach to Agricultural and Rural Development. Read before the Fiftieth Annual Convention of the Association of Land-Grant Colleges and Universities, Houston, Texas, November 17, 1936.

Regionalism and Regional Planning in Relation to College Work. Read before the Association of College Deans, Richmond, Virginia, November, 1936. To be published in the *Proceedings of Southern College Deans,* 1937.

The Quest for Reality. Read before the Faculty Forum, University of Illinois, March 5, 1937.

Which Way Is Forward? Read before the Division of County and City Superintendents, Alabama Education Association, Birmingham, March 17, 1937.

These Southern People. Read before the Mississippi Education Association, Jackson, April 30, 1937.

The Human Aspects of Chemurgy. Read before the Third Dearborn Conference of Agriculture, Industry, and Service, Dearborn, Michigan, May 26, 1937.

Regional Planning for the Development of the Southern People and Their Resources. Read before the Annual Conference on Public Education, Chapel Hill, June 24, 1937.

The Southern People. Presented to a special lecture-seminar on Current Problems in Agricultural Economics, at the University of Kentucky, June 28, 1937.

A New Equilibrium between Agriculture and Industry. Presented to a special lecture-seminar on Current Problems in Agricultural Economics, at the University of Kentucky, June 29, 1937.

A New Realism of the People. Read before the Second Southern Area Institute of Human Relations, Chapel Hill, North Carolina, July 1, 1937. In *Education and Human Relations,* Report of the Institute.

Industrial Relations and the Social Economic Life of the South. Read before the Southern Conference on Human Relations in Industry, Blue Ridge North Carolina, July 17, 1937.

Research and Reality. Read before the Nineteenth Triennial Council, The United Chapters of Phi Beta Kappa, Atlanta, Georgia, September 9, 1937.

PROFESSOR ODUM is continuing the study of regionalism begun in *Southern Regions of the United States.* He is completing with HARRY MOORE a volume on *American Regionalism* to be brought out at an early date by Henry Holt and Company.

In general, the volume will cover the following topics: The Implications and Meanings of Regionalism, From Sectionalism to Regionalism, Physiographic Regions, River Valley Regions, Metropolitan Regionalism, Rural Regionalism, Governmental Administrative Regionalism, Non-Governmental Administrative Regionalism, States, Subregions and Districts, Literary and Aesthetic Regionalism, Regional Planning, Geographers Describe the Region, Anthropologists Discover the Region, Ecologists Evolve the Region, Economists Move Toward the Region, Political Scientists Implement the Region, Sociologists Define the Region, Measures of American Regionalism, the Northeast and Its New England, the Southeast and Its "Old South," the Middle States and Their "Middle West," Southwest Old and New, Far West a New and Transient America. How Much is Northwest, Problems and Strategy of Regional Development Towards a National Unity.

PROFESSOR ODUM is directing a series of supplementary studies in "These Southern People"—a development from the Southern Re-

gional Study—including projects by MARTHA E. EDWARDS, MARGARET JARMAN HAGOOD, MILDRED MELL, KENNETH EVANS, BRUCE THOMASON, ROBERT WOODWORTH, MARY SYDNEY BRANCH, MARY ALICE EATON, RAY V. SOWERS, GOULD BEECH.

PROFESSOR ODUM is continuing his major project in folk-sociology, featuring especially folk-regional society.

PROFESSOR ODUM, in collaboration with HARRIET L. HERRING, continued the study of A University and Its State: North Carolina, 1900-1930.

PROFESSOR ODUM has edited Volume **15** of *Social Forces.*

HAROLD D. MEYER has completed his book, *The Recreation of a Region.* The work is to be published by the Division of Recreation, Works Progress Administration.

PROFESSOR MEYER is now making a study of the Training Opportunities for Recreational Leadership. This study is on a national basis.

PROFESSOR MEYER, with MRS. GERTRUDE SKOW SANFORD, is making a study of the Volunteer Leader in Group-Work Activities of a Recreational Nature.

LEE M. BROOKS has published:

Student Interest in Contemporary Problems. *Social Forces,* **15:** 3. 1937.

Manual for Southern Regions. Chapel Hill: University of North Carolina Press. 1937. (In collaboration with HARRY E. MOORE and others.)

PROFESSOR BROOKS is directing the following research:

HARRIET GATES. (Progress on master's thesis.) Methodological Suggestions for Evaluating the Effect of Institutional Treatment Upon Delinquent Women.

MRS. J. ROGER PEGRAM. (Progress on master's thesis.) An Ecological Study of a Deteriorated Area in a Small Southern City.

J. HERMAN JOHNSON. (Initial stages of doctoral dissertation.) Parole in Alabama.

For reports of the research activities of the following, see section entitled Institute for Research in Social Science, pp. 135-138.

ERNEST R. GROVES. Marriage and the family, the American woman.

RUPERT B. VANCE. Population studies, especially interstate migration, population redistribution, changing population in the Southeast; Southern folk leaders; the Southern agrarian economy.

GUY B. JOHNSON. Studies of Negro leadership and of the Indians of North Carolina.

HARRY ESTILL MOORE. American regions and theories of regionalism.

The following doctoral dissertations were completed during the year under the direction of the Department:

MARGARET JARMAN HAGOOD. Mothers of the South: A Population Study of Native White Women of Childbearing Age of the Southeast. (Under the direction of HOWARD W. ODUM and KATHARINE JOCHER.)

This study is one of a series on the southern people under the auspices of the Institute for Research in Social Science. Its range of findings may be summarized in accordance with the four types of considerations upon which it has been projected.

As a unit of inquiry into one of the categories of regional wealth indicated in *Southern Regions of the United States*, it presents factual data on one age-sex-nativity group of the southern people — the four million native white women of childbearing age. Their numbers, marital condition, occupations, size of family, and fertility are set forth for the region, its states and subregions. Their common heritage of cultural patterns from frontier, plantation, rural life, and religion, which have made for early age of marriage, many children, subjection to husband, and restricted activities, are described. The present results of the interaction of this heritage with diverse geographic, economic, and social factors operative in various locational-occupational groups have produced differentiations of the fundamental pattern of motherhood in the South, four of which are identified and described as typifying an apparent chronological sequence.

As an investigation into the significance of the South for the nation, the study displays the variations of the six major regions of the United States in indices relating to women. The South stands out from the other regions in many respects, especially in its effective reproductivity. The significance of its higher fertility is demonstrated both statistically and actually—in its past effects of supplying migrants to other regions, and in

its present effect of causing an increasing population pressure within the region. Many of the economic and social lags which characterize the region in general are shown to be in their most extreme form coincident with the highest fertility in the mountainous subregions. The present economic plight and the future educational problems have been related to this "seed-bed" functioning of the region.

The study has certain implications for regionalism and planning. One interpretation is that the fertility of these mothers will produce a supply of people in the next generation greater than the forecasted demand. Planning for this surplus is imperative. The other interpretation of the relatively greater reproductivity of the Southeast is in terms of its function as a buffer against too rapid change in age composition of the population, and its providing a longer period of comparative stabilization of the nation's population during which determination of regional and national optima and initiation of programs and policies for arriving at and maintaining such may be accomplished.

Certain statistical methods are adapted and applied to the analysis of variation of the several orders of a real units in demographic indices. These are comparisons of range of variation and of magnitudes of differentials, coefficients of correlation, and a synthesis of two procedures for computing weighted standard deviations with Fisher's method of analysis of variance and with the process for deriving a coefficient of variability. The results of the applications of these methods support the thesis that regional differences are real and significant, and are not merely reflections of rural-urban differences.

BERNICE MILBURN MOORE. Age and Sex Distribution of the People as Conditioning Factors in Cultural Participation: A Study in Regional Demography of the United States. (Under the direction of ERNEST R. GROVES.)

Age and sex distribution in the population of the United States displays variation in relation to certain elements in the totality of the national culture. Such variations condition the adequacy of participation in culture, and factors pertaining to the cultural lag of certain areas can be ascertained because of these interacting causes. Further, differentials in age and sex distribution tend to fall in given patterns within certain areas, lending another index of measurement to regional divisions of the United States.

Concentration of folk in given regions within certain age groups brings about a concentration of material as well as human wealth. As examples of this the Northeast and the Middle States may be taken. These two most industrial provinces in the nation have drawn into themselves the highest percentage of productive men and women, both in terms of physical and mental vitality and alertness. Moreover, these same regions are failing to reproduce themselves and have so limited their child-burden that the matrix of their culture is adult. Again, concentration of younger men and women has a distinct relationship with the concentration of institutions within the region necessary for adequacy in cultural participation.

On the other hand, the Southeast, region of high reproductive rate, low income, agrarian economy, exploitive social order both as to human beings in tenancy and as to soil in a one-crop system, has lost to other regions of the nation in vitality and energy, to say nothing of a loss in actual wealth by migration of its productive age groups. Again, because of the above-mentioned factors, the Southeast receives comparatively little in cultural adequacy in return for her supply of folk to the industrial regions of the nation.

Southwest and Northwest and Far West indicate problems in social organization and control relative to the conditioning of age groupings within the respective regions. In contrast to all the other regions, the Far West has the lowest reproductive rate in the nation and the highest young adult and middle-aged group and is rapidly developing an age-burden which will color and regulate its participation in the national culture.

Involved in this matter of distribution are such vital elements as the educational policy of the nation in relation to curriculum, age limit and support; as to industrial policy with relation to the limits of age of employment both maximum and minimum; as to the cultural-intellectual future of the country if its replacement in population comes from areas of comparative cultural inadequacy; as to the care of the aged both by families and the nation; as to the future of family limitation and its regional implications. Finally, an interpretation of intra-regional, as well as interregional, variations, with regard to distribution of folk by age and sex, with relation to urban, rural farm, and rural non-farm residence, is presented.

HARRY ESTILL MOORE. Theories of Regionalism. (Under the direction of HOWARD W. ODUM.)

Ideas concerning regions and the region as a basis of geographic study may be traced back to the earliest writings, but the concept of regionalism as now used is of comparatively recent origin. The works of Kohl, Ritter, and Ratzel, in their search for a philosophy of history, gave rise to the study of human geography; and this study has more and more confined itself to regional analysis. In France, England, and Germany "schools" of regional-human geographers have appeared within the last few decades. In the United States it appears that the French and German ideas are followed more closely than those of the English, who conceive the discipline more in terms of the relationship of man to environment than do the others.

Ethnological studies, particularly in America, have inductively developed the idea of the culture area; an area characterized by similarities of culture. This concept grew up from the accumulation of field data, mostly of material sorts, but has more recently been applied to immaterial culture traits. Within the past few years it has also been applied to contemporary situations, both among "primitives" and civilized peoples. Out of this study has grown the idea of culture patterning.

Similar to the anthropological approach, but also containing a heritage from biology, is the ecological concept of the region as an area in which persons and institutions compete for means of subsistence. This concept of the region is marked by its emphasis on interrelationships.

In economics little work has been done on the regional idea by scholars formally discussing economic theory; but a considerable amount of work has been done in the fields of location of industry, natural resources, and trade relationships which has important implications for regionalism.

Historians and political scientists have written much about sectionalism. This is closely akin to, but must be distinguished from, regionalism. Out of this study have come various plans for rearrangement of governmental functions and an emphasis on the traditional and historic factors in regional consciousness.

In Europe these various aspects of the problem have been more or less combined into conscious movements. This is most apparent in France and Spain; less so in Italy, England, and Germany. Recognition of regional diversities and planning to preserve them is very marked in Russia.

It seems apparent that no single approach to regionalism is satisfactory; hence a concept of the region as a microcosm of society, in which most of the elements found in society in general are reproduced on a smaller scale, is presented. This is, in part, an adaptation of *gestalt* psychology to sociology; an insistence that the parts cannot be understood except in relation to the whole. This idea of the region also emphasizes the folk basis of society; the importance of the unorganized, unrationalized mechanisms by which relatively large units of society are able to acquire essential cohesion and to provide for their continuation.

JOHN MILLER MACLACHLAN. Mississippi: A Regional Social-Economic Analysis. (Under the direction of HOWARD W. ODUM.)

Mississippi, as a political division of the southeastern United States, is composed of segments of major southeastern social-economic-geographic regions. The first task of the inquiry was to establish the areas of these regions through the comparative study of more than 200 indices of social, economic, and agricultural reality. The regional borders are drawn along county lines in order to permit maximum use of the data of the United States Census.

The regional areas encompassed by Mississippi are of two chief types. On one hand are the "plantation" regions, (the Yazoo-Mississippi Delta, the Loess-alluvial counties, the Cane Hills, the Northeast Prairie), characterized by very high rations of tenancy and by intensive production of agricultural values. On the other hand are the "upland" regions, where the soils are less fertile, the agricultural economy is less affected by "cash crop" farming, and other social-economic data are comparably modified.

The social-economic contrasts between these types of regions appear both in historical records and in analysis of contemporary data. Examination demonstrates that a reciprocal selective relationship exists between types

of land and types of agricultural development. The resulting social-economic contrasts extend, at least in part, into many secondary data such as the sex ratios, age distribution, death and birth rates of the population.

Analysis of the types of land holdings, of crop-production data, and of all available statistical material relating to agriculture, indicates that significant differences exist between the farmers of the two races, between the distinguishable cotton-producing areas, and between the tenure-categories of farmers of each race. The increase of farm tenancy and of farm mortgage debt is associated with the increase of "cash-crop" cotton production throughout the state. It is shown that the agricultural economy of Mississippi was in a crucial condition even before the decline of farm prices in 1930 and subsequent years.

The cities and towns of Mississippi are described chiefly as centers for the distribution of goods and services to the people of an agrarian state. Extended reference to the Census of Manufactures and the Census of Distribution, Retail and Wholesale, indicates the relatively small importance of manufacture and industry in the state. A recent legislative program, designed to "balance agriculture with industry," is described as possibly anticipating a trend toward industrialization.

The following master's theses were accepted by the Department during the year:

KATHARINE LEWIS BARRIER. Seventeen Hundred Economically Handicapped Families, A Study of Families in Orange County, North Carolina, Aided by Federal Emergency Relief. (Under the direction of ROY M. BROWN.)

This study presents a statistical picture of the families and individuals in Orange County receiving Federal relief, and the number of recipients who fifteen months after the termination of the Federal Emergency Relief Administration were known to the Orange County Department of Public Welfare. Included in the study are an analysis of the county and its economic resources and a review of the Federal relief program from the standpoint of the nation, state, and county. The gains, both material and intangible, made by Orange County as a result of this period are discussed.

The study reveals that over forty per cent of the county's families received aid, and that these families were largely farmers, mill workers, and laborers. Over sixteen per cent of these same families have returned to the welfare agency. The economic factor entered into the majority of the reasons for return.

J. MCLEAN BENSON. Sterilization with Special Reference to Orange County, North Carolina. (Under the direction of ERNEST R. GROVES.)

This is a study of the development of sterilization as a eugenic agent for race improvement, showing the need and possibility of extending a program of sterilization to be a more effective agent in the eugenic control of the human race in the United States in the future.

Orange County cases were used as a special study in relation to the cases of the State of North Carolina.

General conclusions drawn included the extension of the program of sterilization to all states, with the establishment of effective state organizations.

JAMES PAYNE BECKWITH. A Sociological Study of Police in North Carolina, with Special Reference to Personnel Selection. (Under the direction of LEE M. BROOKS.)

The selection of the police in North Carolina, as compared with that of other regions in the United States and Europe, is still a matter of political crudity. The more serious problems in police work will approach solution through the adoption of civil service with high standards of education and special police training. The success of such a program would depend upon the establishment of adequate training schools and improved equipment. If the present standards of the police are to be raised, it is essential that more rigid requirements in the selection of personnel be set up and enforced. Police efficiency depends upon proper training and detachment from politics—qualifications not yet common in the State of North Carolina. Only when the public demands a higher type of police service will it become a reality.

EFFIE ESTELLE DOAN. A State and Its Children: North Carolina, 1900-1936, as measured by the Children's Charter. (Under the direction of KATHARINE JOCHER.)

This thesis has traced the development of interest in and activities for the protection of children and maintenance of their health from birth to school age during the past thirty-six years. It has concerned itself with maternal welfare and with such measures as must be taken in children's behalf when unfortunate circumstances deprive them of their own homes.

An attempt has been made to show that the interest and activities of this first third of the twentieth century have given the United States and each individual state minimum standards by which national and state progress in child welfare can be measured. An extensive array of these minimum standards as they affect child life are set forth, culminating in *The Children's Charter*, adopted officially by the White House Conference on Child Health and Protection, 1930.

As an illustration of the possible use of each of the aims of The Charter, often called "The Children's Bill of Rights," Principle IV (of the nineteen aims set forth) was set up as a measurement of the child's right to be well-born in North Carolina. Studies were made of prenatal, natal, and

post-natal care, and the continuing efforts to keep him well and developing properly during his pre-school years according to the standards considered vital thereto by social welfare and health authorities.

The sources of information used were official bodies, governmental reports, and statements from publications that have stood the test of time.

LUCILE AYERS GODBOLD. The Contribution of Women In the Development of American Religion. (Under the direction of ERNEST R. GROVES.)

During the Colonial Period women had little power in the church. There were, however, a number of Quakeresses who preached and did other religious work. By the end of the period Puritanism was localized and the denominations were gaining.

In the nineteenth century the Industrial Revolution took women into the world and the Westward Movement gave them freedom. Education prepared women for church and club life. The churches were divided into northern and southern branches. There were a few interesting women preachers.

In the twentieth century women helped in war work, for peace, interracial work, for temperance, and in church organizations. A coördination of religious activities took place.

There has always been opposition to women preaching and even holding church offices, although they are allowed, even encouraged, to work in the church and raise money. Their influence on religion has been indirect, but they have done much to shape policies.

JEAN MCCAIG. An Analysis of Public Welfare Services to 422 Cases in Orange County, North Carolina, January 1 to December 31, 1936. (Under the direction of KATHARINE JOCHER.)

This study presents an analysis of 422 case records made to determine, if possible, the major types of problems coming to the attention of the County Department of Public Welfare, the services rendered by the agency, and the facilities utilized in the treatment of these particular social ills during the year 1936. Statistical data were assembled by means of a specially prepared schedule.

The cases analyzed comprised 1,765 people. Eight hundred and forty-six separate problems represented 105 types of problems confronting the Department, the largest single group being economic difficulties, which were found in 193 or 45.73 per cent of the cases studied. Thirty-two types of services covering 540 actual services were rendered by the agency during the year, economic aid being given more often than any other. The fundamental need as indicated by this study is a larger financial appropriation: (1) for social services, particularly relief, hospitalization and mother's aid; (2) for administrative purposes, which would make possible the requisite increase in staff.

MYRTLE POWELL MIZELL. State Differences in the Southeast As Indicated in a Decade of State Bibliographies. (Under the direction of HOWARD W. ODUM.)

The main part of this thesis is a classification of 10,752 pieces of bibliographical material of the fifteen states located in the southern part of the United States for the period 1920-1930. This classification is made according to states; the type of writing, as books, magazine articles, pamphlets, and public documents; the subject matter, as business and industry, cities and towns, education, government, natural resources, people, public welfare, transportation and travel, and rural features. On the basis, then, of the bibliography an analysis is made showing the various interests and trends of thought exemplified in the writings; also the subjects which gained the least attention in writing are noted. This thesis, thus, is an effort to point out the differences of the various Southern States, as shown by the literature. An appendix consisting of one table for each state, and one table showing the distribution of the total bibliography, completes the thesis.

MARGARET KELLEY PERRY. A Study of Social and Legal Changes of Status of Women Following the Civil War. (Under the direction of E. R. GROVES.)

The Civil War had a profound influence on the American woman both in the north and south. Conditions created by the conflict broke down many of the barriers that had kept woman in the home. Changes were made in the direction of enlarging the sphere of woman's activities, increasing her liberties, and opening up larger possibilities.

One of the greatest advancements hastened and stimulated by the Civil War was made in woman's education. The first college for women equal to the men's colleges was established, vocational education was made available, and co-education was started. Economically, women became independent; they conquered the teaching profession, entered the factories in large numbers, gained admittance to many professions, including law, medicine, and theology. Their low legal status was raised, but it was not in keeping with their social and economic advancements. The emancipation of women came much earlier in the north than in the south because of the background and tradition of the southern women and their struggle through the reconstruction.

VINCENT HEATH WHITNEY. Social Resources of the Southeast: A Definition and Classification of Agencies and Institutions, Public and Private. (Under the direction of HOWARD W. ODUM.)

This paper has two purposes. It attempts, first of all, to present as inclusive a listing as is possible of all national and state agencies and institutions, both public and private, in the eleven states of Alabama,

Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia which may be of use in a program of social welfare or of social planning. It attempts, secondly, once available resources have been catalogued, to uncover wasteful, overlapping social and geographic areas of deficiency and, through an appraisal of the existent social organization, to suggest opportunities for improvement in the present set-up.

From this study it seems apparent that a unified and integrated social plan is the basic social need of the region. The need for coördination and integration of existent agencies is greater than that for additional agencies; and it is through a fulfillment of this need that both human and geographical coverage must be increased. Standards of operation and standards of personnel must both be raised. Widespread wasted opportunities must be made useful opportunities by discovering and acknowledging their existence and by applying a trained personnel to the task of administering a planned program. Preliminary to any intelligent integration of activities there is the necessity of the assembly and study of facts. The size of the task at hand must be understood; questions of time and of lay support and of public policy must receive adequate treatment. Only when this is done can the present drain of social and economic waste be eliminated in the south and the progress which the abundance of natural and human resources present in the region should make possible be realized.

DEPARTMENT OF ZOOLOGY

H. V. WILSON has continued his investigation on the breaking up of syncytia into cells in sponges. He presented some of the results in a Dohme lecture at Johns Hopkins University, October 12, 1936, under the title Cell Behavior and Cænogeny—two points of view in the study of embryology.

PROFESSOR WILSON is directing the following doctoral dissertations:

J. A. FINCHER. The Origin of the Germ Cells in Tetraxonid Sponges.

G. H. TUCKER. The Origin of the Germ Cells and the Development of the Gonads in Ascidians.

R. E. COKER has continued studies of conditions controlling cyclomorphosis in Daphnia. He has published the following:

A New Apparatus for Constant Temperatures. *Science,* **84**: 531-582. December, 1936. (With E. W. CONSTABLE.)

A brief note regarding an apparatus more fully described in the *Journal of the Elisha Mitchell Scientific Society.*

Culture Method for Cyclopoid Copepods and Other Organisms. In *Culture Methods for Invertebrate Animals.* Comstock Publishing Company. 1937. Pp. 226-228.

C. D. BEERS has published:

The Culture of *Didinium nasutum. Culture Methods for Invertebrate Animals,* 100-103. Comstock Publishing Company. 1937.

The maintenance of stock cultures and pure lines and the induction of encystment are considered with special reference to food, temperature, chemical and physical properties of the medium, metabolic waste, and excessive bacterial growth.

Technique in the Preparation of Chick Embryos for Class Use. *Journal of the Elisha Mitchell Scientific Society,* **53**: 115-118. 1937.

Primitive-streak stages are fixed on micro slides in Bouin's fluid and removed from the slide after hardening in alcohol. Older stages are pinned out under salt solution with stainless steel insect pins on black, weighted paraffin blocks. Both block and embryo are then immersed in Bouin's fluid.

The Viability of Ten-Year-Old Didinium Cysts (Infusoria). *American Naturalist,* **71**: 521-525. 1937.

Twenty vials containing cysts of *Didinium nasutum* in hay infusion were stored away in October, 1926, in an attempt to ascertain the maximum length of survival in the encysted state. Viability tests, made annually beginning with the seventh year, showed that two vials still contained living cysts in October, 1936, ten years after encystment.

A Method for the Sectioning of Protozoa En Masse. *Science,* **86**: 381-382. 1937.

An area of transparent mammalian mesentery is tied over a 2-mm. paraffin sphere and fixed in this position to make a bag, the paraffin interior of which is later dissolved out with xylene. The protozoa are put into the bag and both are sectioned.

C. D. BEERS is bringing to completion a cytological study of the endocommensal ciliates Hoplitophyra and Ladopsis, with special reference to the organelles of attachment.

D. P. COSTELLO has completed an investigation begun several years ago at the Marine Biological Laboratory at Woods Hole, Massachu-

setts. It has been accepted for publication in the *Journal of Cellular and Comparative Physiology* under the title, The Effect of Temperature on the Rate of Fragmentation of Arbacia Eggs Subjected to Centrifugal Force.

D. P. Costello and Helen M. Costello have completed and submitted for publication a paper entitled A New Species of Polychoerus from the Pacific Coast. The material was collected and studied chiefly at the Hopkins Marine Station of Stanford University during the summers of 1936 and 1937.

Abstracts of these articles will be printed in this record when the papers are published.

W. L. Engels is continuing some studies on the anatomy of birds begun at the University of California, and is initiating a survey of the distribution of land vertebrates in North Carolina.

Part III

RESEARCH ORGANIZATIONS AND PUBLICATIONS

INSTITUTE FOR RESEARCH IN SOCIAL SCIENCE

Howard Washington Odum, *Director*
Katharine Jocher, *Assistant Director*

Substantial grants from the Laura Spelman Rockefeller Memorial and the Rockefeller Foundation, made to the University of North Carolina for the study of problems in the social sciences arising out of state and regional conditions, led to the establishment in 1924 of an Institute for Research in Social Science. The work of the Institute represents, therefore, a specific program of regional social research, study, and interpretation, with studies in population, local government, southern historical backgrounds, socio-economic activities (including studies in social-industrial relationships), crime and criminal justice, the Negro, folklore and folk backgrounds of the southern people, social institutions, public welfare and child welfare, and human geography of the American South. While chosen for the most part from the state and regional field, research projects are selected with a view to their generic value and for their possible contribution in both method and content.*

The Institute has published during the year:

Southern Regions of the United States. (Second Printing.) By Howard W. Odum. Chapel Hill: The University of North Carolina Press. 1937. 664 pp. Some 600 maps and charts and tables in addition to text matter.

Manual for Southern Regions. To accompany *Southern Regions of the United States,* by Howard W. Odum. By Lee M. Brooks in collaboration with Wayland J. Hayes, Harry E. Moore, and Jennings J. Rhyne. Chapel Hill: The University of North Carolina Press, 1937. 194 pp.

---

* For a further statement regarding the establishment and the purposes of the Institute and for book lists of publications, see *Research in Progress,* 1928-1929, pp. 95-97; 1929-1930, p. 80; 1930-1931, p. 89; 1931-1932, p. 90; 1932-1933, p. 91; 1933-1934, pp. 95-96; 1935-1936, pp. 101-102.

For a report of the research activities of Howard W. Odum in American regionalism; These Southern People—a supplementary study to the Southern Regional Study; folk-regional society; see section entitled Department of Sociology, pp. 120-130.

Ernest R. Groves has published during the year:

The American Woman. The feminine side of a masculine civilization. New York: Greenberg. 1937.

The volume contains the following chapters: The Cultural Background of the American Woman; The Colonial Woman; The Frontier Woman; The Woman of the North from the Revolution to the Civil War; The Woman of the South from the Revolution to the Civil War; The Woman of the Middle West and the Great Plains; Woman, North and South, During and After the Civil War; Woman's Political and Social Advance; Woman's Industrial and Educational Advance; The American Woman in the Twentieth Century; The American Woman and Her Changing Status.

Hazards of Modern Marriage. (Address to the Duke Bar Association.) *Duke Bar Association Journal,* **5**: 2: 66-74. Spring, 1937.

Professor Groves was co-author of the Report on Hereditary Strength of the Committee Report *Implications of Social Economic Goals* for the National Education Association of the United States, 1937.

Professor Groves is continuing his researches in marriage and the family.

Professor Groves directed the following research:

Bernice Milburn Moore. (Doctoral dissertation in the Department of Sociology.) Age and Sex Distribution of the People as Conditioning Factors in Cultural Participation: A Study in Regional Demography in the United States.

(For abstract, see Department of Sociology.)

Margaret Kelley Perry. (Master's thesis in the Department of Sociology.) A Study of Social and Legal Changes of Status of Women following the Civil War.

(For abstract, see Department of Sociology.)

Rupert B. Vance has published during the year:

Farmers Without Land. New York: Public Affairs Committee. 1937. 32 pp.

PROFESSOR VANCE prepared a report on Research into the Carrying Capacity of the Southern Economy for the Research Conference of the Southern Regional Committee of the Social Science Research Council, New Orleans, March 12, 1937. Mimeographed.

PROFESSOR VANCE has served as:

Member of the Technical Committee on Population Problems for the National Resources Committee contributing to the sections on Population and Economic Resources and Cultural Diversity in the forthcoming Report on Problems of a Changing Population.

Senior Consulting Social Economist to the Social Security Board, contributing sections on Interstate Migration of Labor and the Trend Toward Insecurity in the Modern Economy.

Chairman of a Committee of the Social Science Research Council on Population Redistribution, preparing a memorandum on the status of research in that field.

DR. VANCE is continuing research on:

Southern folk leaders in politics in the post-reconstruction period.

DR. VANCE has under way researches in the problems of a changing population in the southeast, a unit in the study of "These Southern People." In this connection he is also directing research projects by HAROLD GEISERT, GORDON BROWDER, FRANCIS S. WILDER, and RICHARD ASHBY.

DR. VANCE directed the following research:

OLIVE M. STONE. A Study of Agrarian Movements in Alabama. (Progress on doctoral dissertation in the Department of Sociology.)

JOHN MILLER MACLACHLAN. (Doctoral dissertation in the Department of Sociology.) Mississippi: A Regional Social-Economic Analysis.

(For abstract, see Department of Sociology.)

HARRIET L. HERRING has published during the year:

Part-time Farming in the Eastern Cotton Belt. Final report on a group of five subregional studies written for and published by the Research Division of the Works Progress Administration.

Miss Herring has prepared for publication in the *Journal of Southern History* a paper on "The Clement Attachment," based on a chapter in her History of the Textile Industry in the South.

Miss Herring has under way a study of an industrial community, illustrating how outside owners have conformed to the southern industrial pattern.

Miss Herring has also resumed her work on the History of the Textile Industry in the South.

In collaboration with Howard W. Odum, Miss Herring carried forward the study of A University and Its State: North Carolina, 1900-1930.

Katharine Jocher directed the following research:

Effie Estelle Doan. (Master's thesis in the Department of Sociology.) A State and Its Children, 1900-1936. As Measured by the Children's Charter.

(For abstract, see Department of Sociology.)

Jean McCaig. (Master's thesis in the Department of Sociology.) An Analysis of Public Welfare Services to 422 Cases in Orange County, North Carolina, January 1 to December 31, 1936.

(For abstract, see Department of Sociology.)

Dr. Jocher assisted in editing Volume **15** of *Social Forces.*

Guy B. Johnson has published the following:

Negro Racial Movements and Leadership in the United States. *American Journal of Sociology,* XLIII: 57-71. July, 1937.

Dr. Johnson held a post-doctoral fellowship of the Social Science Research Council during the year and was on leave from the University. He visited at the University of Chicago and Yale Univerversity, studying recent developments in sociology and anthropology, with special reference to problems of race and culture contacts.

Dr. Johnson continued his study of the Tri-Racial Community in Robeson County, North Carolina, devoting a part of the summer of 1937 to field work in Robeson County.

HARRY ESTILL MOORE has published during the year:

What Is Regionalism? A brief exposition of the concept "Regionalism." Chapel Hill: The University of North Carolina Press. 1937. (A Southern Policy Paper.)

In collaboration with DOCTORS LEE M. BROOKS of the University of North Carolina, WAYLAND J. HAYES of Vanderbilt University, and JENNINGS J. RHYNE of the University of Oklahoma, a *Manual for Southern Regions,* designed for the use of lower level college students and adult study groups as an aid in the study of *Southern Regions of the United States,* by HOWARD W. ODUM. Chapel Hill: The University of North Carolina Press. 194 pp.

Problems of Reintegration in Agrarian Life. With BERNICE MILBURN MOORE. *Social Forces,* **15**: 384-390. March, 1937.

DR. MOORE completed his researches into the Theories of Regionalism, under the direction of HOWARD W. ODUM. (See Department of Sociology, pp. 125-126, for abstract.)

With HOWARD W. ODUM, DR. MOORE is completing a volume on *American Regionalism* to be brought out at an early date by Henry Holt and Company. (For details see HOWARD W. ODUM in the Department of Sociology, p. 121.)

DR. MOORE also carried on research on the Negro family in the South.

In collaboration with BERNICE MILBURN MOORE, DR. MOORE is making a study of the theoretical implications of Pitirim A. Sorokin's systematic work, *Cultural and Social Dynamics.*

BERNICE MILBURN MOORE has published during the year:

The Family: Old Functions and New. *Texas Parent-Teacher Magazine,* September, 1937.

Problems of Reintegration in Agrarian Life. With Harry Estill Moore. *Social Forces,* **15**: 384-390. March, 1937.

DR. MOORE completed her researches into the Age and Sex Distribution of the People as Conditioning Factors in Cultural Participation: A Study in Regional Demography in the United States, under the direction of ERNEST R. GROVES. (For abstract, see Department of Sociology, pp. 124-125.)

Dr. Moore delivered a paper on The Present Status and Future Trends of the Southern Family, at the annual meeting of the Southern Sociological Society, held at Birmingham, Alabama, April 2, 1937. To be published in *Social Forces.*

Dr. Moore prepared a paper on Problems of the Southern Family for the Conference on the Teaching of Marriage held at the University of North Carolina, June, 1937, under the sponsorship of Professor Ernest R. Groves.

In collaboration with Harry Estill Moore, Dr. Moore has under way a study of the theoretical implications of Pitirim A. Sorokin's systematic work, *Cultural and Social Dynamics.*

Margaret Jarman Hagood has published during the year:

Some Contributions of Psychology to Social Case Work. *Social Forces,* **15**: 512-518. May, 1937.

Dr. Hagood has completed her researches on the Mothers of the South: A Population Study of Native White Women of Childbearing Age of the Southeast, under the direction of Howard W. Odum. (For abstract, see Department of Sociology, pp. 123-124.)

Dr. Hagood has also completed an Analysis of Variance in a Demographic Index with a proposed criterion for Regional Classification. (To be published shortly.)

Dr. Hagood has under way Case Studies of Several Locational-Occupational Groups of Mothers in the Southeast.

Francis S. Wilder has under way a study of Southern Standards of Living.

A tabular analysis of past studies of family living in the United States as to aim, scope, auspices, and nature of the published reports, is nearly completed. This is to be followed by a field study and an analysis of the nation-wide study of family living, known as the Consumer Purchases WPA project, now being completed by the U. S. Bureau of Labor Statistics, the U. S. Bureau of Home Economics, and several other governmental agencies.

Mr. Wilder also has under way, in collaboration with D. F. Fenn and Richard Ashby, a study of Florida migration.

PROCEEDINGS OF THE ELISHA MITCHELL SCIENTIFIC SOCIETY

OCTOBER 13, 1936, TO MAY 11, 1937

R. W. BOST, *President*

ENGLISH BAGBY, *Vice-President*

E. T. BROWNE, *Permanent Secretary*

E. L. MACKIE, *Recording Secretary*

370TH MEETING, OCTOBER 13, 1936

M. J. ROSENAU: *Epidemics of Influenza.*

A brief account of the history of influenza and its devastating pandemics which sweep the world at irregular intervals, about a generation apart. The mystery of the disease and recent advances concerning the discovery of its cause in the shape of a filterable virus. The modes of transmission, period of incubation, and other salient factors concerning the disease were given. Experiments with the disease on Cape Cod in the two towns of Brewster and Chatham were related, and experiments during the great pandemics of 1917 and 1918 on the cause and mode of transmission of the disease were described.

371ST MEETING, NOVEMBER 10, 1936

S. E. SMITH: *Permeabilities of Cellulosic Films.*

The term "cellulosic films" includes films of regenerated cellulose and films of cellulose derivatives. The common property of the cellulose type "molecules" is vast length, relative to the other dimensions. Lateral attraction between these long chains results in the coherence of cellulose structures.

Cellulose films are hygroscopic. The moisture content is of prime importance to the condition of the film. The phenomena of swelling are well known among cellulose structures. The moisture content is also the determining factor in the permeability to gases. Dry cellulose films are completely impermeable to the permanent gases, while the permeabilities of moist films are in the ratio of the water solubilities of the diffusing gases.

T. F. HICKERSON: *Secondary Stresses in Bridge Trusses.*

When a bridge truss is subjected to primary axial stresses due to loads applied at the joints, the tension members become slightly longer, and the compression members correspondingly shorter. The angles formed by the members meeting at a joint, therefore, tend to increase or decrease. This angular change may take place freely in the pin-connected truss without

restraint, but if the truss members are rigidly connected at the joints due to riveting or welding, bending will be induced. The stresses resulting from this bending are called Secondary Stresses. They are greatest near the ends of the members.

The following steps indicate the general procedure in the proposed method for computing Secondary Stresses:

(1) Knowing the deformations in each member of the truss due to the primary axial stresses (obtained by dividing the products of the unit stresses times the length by the modulus of elasticity (E)), determine the displacements of the joints from a Williot diagram; or preferably, determine the rotations of the members from the computed angle changes of the truss triangles as though they were pin-connected.

(2) Determine the relative displacements (d/L-values) of the ends of each member from Step 1, with plus sign for clockwise rotation and minus sign for counter-clockwise rotation.

(3) Calculate each joint rotation (θ) from the formula:

$$\theta = \frac{3\Sigma K \frac{d}{L}}{2\Sigma K} \tag{1}$$

in which

$$K = \frac{I}{L} = \frac{\text{Moment of inertia}}{\text{Length of member}}$$

(4) Letting the letters N and F refer to the "near" and "far" ends of the members, calculate each joint rotation (θ_N) by successive approximations; the first value is given by Eq. (1), and the other values are those brought over from the adjacent joints, the carry-over factor along any member being $-\frac{K}{2\Sigma K}$. Thus:

$$\theta_N = \frac{3\Sigma K \frac{d}{L}}{2\Sigma K} - \frac{\Sigma K \theta_F}{2\Sigma K} \tag{2}$$

(5) Compute the desired bending moments by means of the Slope-Deflection formula,

$$M_{NF} = 2EK\left(2\theta_N + \theta_F - 3E\frac{d}{L}\right) \tag{3}$$

from which the stresses follow directly.

372ND MEETING, DECEMBER 8, 1936

E. A. CAMERON: *On Loci Associated with Certain Osculants of a Plane Curve.*

Some geometric relations existing among certain osculants to a plane curve at a point were discussed. A study was made of the loci determined by these osculants as the point of contact is allowed to move along the base curve. Specialization of the base curve led to some interesting results.

J. F. DASHIELL: *The Experimental Background of the Gestalt Movement in Psychology.*

A few of the pioneer experiments leading to the development of the Gestalt school of psychological theory are described in simplified form. They are the phenomenon of apparent-movement (Wertheimer), the choosing of grays by hens, apes, and children (Köhler), the insightful learning of apes (Köhler). Other illustrations are incidentally introduced to clarify the Gestalt emphasis throughout upon wholeness as opposed to atomism in any field of psychology.

373RD MEETING, JANUARY 12, 1937

D. P. COSTELLO: *Notes on the Breeding Habits of Some Pacific Coast Nudibranchs.*

The nudibranchs are a group of marine gastropod molluscs characterized chiefly by the absence of a shell. In common with most gastropods, nudibranchs are hermaphroditic, and the animals, by pairs, practise reciprocal fertilization. Two to twenty-one days after mating, each member of the pair deposits a ribbon-like egg mass of fertilized eggs. The eggs are enclosed in capsules arranged in transverse rows across the ribbon, cemented together by a gel, and the ribbon is attached by one edge to the substratum in the form of a spiral of Archimedes. The egg ribbons of twenty species were studied and in all cases it was found that the spirals of Archimedes had been deposited in a counterclockwise direction (viewed dorsally).

OTTO STUHLMAN: *The Bio-Physics of the Human Ear.*

Published in the *Jour. Amer. Acous. Soc.*, **9**: 119. 1937.

374TH MEETING, FEBRUARY 2, 1937

EDWARD MACK, JR.: *Why Rubber Stretches.*

An attempt at a theory of the mechanism of elastic stretching in rubber was made. The explanation was given in terms (1) of the free rotation of carbon atoms about single bonds, and (2) of the attraction between hydrogen atoms of the hydrocarbon molecules. Some of the more important properties of the various forms of rubber were discussed from the point of view of strict adherence to the principles of geometry and of structural organic chemistry. Among the topics discussed were: shape of the rubber molecule, the work of stretching rubber, the shape of the stress-strain curve, heat effects in rubber, and properties of synthetic rubbers.

375th Meeting, March 2, 1937

H. Ward Ferrill: *The Adrenals and Experimental Diabetes.*
For full paper, see Archiv. of Int. Med.

The etiology and course of diabetes mellitus has been associated with adrenal function by various authors, since Zuelzer (1907) proposed that a mutual antagonism exists between the adrenals and pancreas. Due to the disagreement among workers and due to the fact that the supposed relationship of the two glands has in recent times led to surgical procedures, this problem was undertaken and carried out on a suitably large number of animals to be of significance.

The report is concerned chiefly with experiments to determine whether reduction or suppression of epinephrine secretion from the adrenal glands exerts a significant influence on experimental diabetes. In these experiments the criterion was the amount of insulin required to maintain the level of sugar excretion in the urine below about five grams daily and the concentration of sugar in the urine below about one per cent. The experiments were performed on dogs.

All the experimental and control animals were kept under identical or comparable conditions, on a constant diet consisting of 500 grams of boiled beef lung and 100 grams of cane sugar daily, divided into two meals. In the morning meal 50 grams of fresh raw beef pancreas was added. Drinking water was available at all times. Daily administration of insulin was divided into two doses and given at the time of feeding. Urine was collected for 24 hours, the quantity excreted and the sugar content determined at the same hour each morning.

Interference with epinephrine secretion was accomplished by excision of one adrenal and denervation of the other gland. In addition to denervation, the medulla of the remaining gland was curetted by drilling with a dental burr, so that most of the medulla was destroyed or damaged. The adrenal operations in these animals were performed in two stages and pancreatectomy was performed during the interval between the adrenal operations. Other dogs were depancreatized without subjecting the adrenals to operations for reducing the epinephrine secretion. These served as controls. At the end of different periods of observation the experiment was terminated and the animals sacrificed for quantitative determination of the degree of reduction or suppression of epinephrine secretion by the method employed by Stewart and Rogoff.

From this series of experiments it has been concluded that:

1. The supposed dependence of experimental pancreatic diabetes on epinephrine secretion from the adrenals is not supported by substantial experimental evidence.

2. Severity of diabetes in depancreatized dogs is not modified by reduction or suppression of epinephrine secretion from the adrenals.

3. Insulin requirement on a constant diet is within the same range in depancreatized dogs and in dogs with reduced or suppressed epinephrine secretion in addition to pancreatectomy.

4. Depancreatized dogs with reduced or suppressed epinephrine secretion are not more sensitive to insulin than ordinary depancreatized dogs.

5. Depancreatized dogs kept for some weeks on a constant diet with adequate amounts of insulin to control glycosuria sooner or later show a reduction or suppression of epinephrine output from the adrenals.

6. Results obtained on depancreatized animals that have been subjected to operations on the adrenals should be interpreted with extreme caution unless the animals are obviously in excellent physical condition.

W. C. GEORGE: *The Significance of Blood in the Classification of Animals.*

The cytological details of blood cells sometimes afford taxonomic details that may be of significant help in cases difficult of classification. In the ascidians there are certain features of blood histology that appear to be familial in distribution, others generic, and still others specific. For example, certain peculiar cells, called colorless morula cells, are present in all species of the family Ascidiidæ studied; they are not known to occur in representatives of any other family. They have distinct features for the different species and subspecies known to the author. The genus Ecteinascidia appears to be distinguished, furthermore, from all other ascidians by the presence of fusiform granules in the orange cells. These granules of orange pigment have characteristic size variations in the different species. The two genera of the family Botryllidæ are distinguished from one another by the presence of pigmented cells characteristic of each. In addition to the colored cells common to both genera, the genus Botryllus has cells with dark blue pigment and the genus Botrylloides has cells with brownish red pigment.

376TH MEETING, APRIL 6, 1937

E. W. MCCHESNEY: *The Identification of the Amino Acids.*

Published in full in *Jour. Amer. Chem. Soc.*, **59**: 1116. 1937.

T. F. HICKERSON: *Multi-Storied Building Frames.*

Using the Slope-Deflection equations for an exact solution of multi-storied frames involves the determination of the rotation of every joint and the sidesway of every story. Accordingly, one is confronted with as many equations, to be solved simultaneously, as there are joints and stories in the framework, unless the bent is symmetrical about a vertical center line, in which case the number of unknown rotations are reduced fifty per cent.

The formal algebraic solution becomes exceedingly laborious and time consuming when the number of equations exceeds three or four, and therefore the so-called exact method is not accepted as a satisfactory office method.

Whatever procedure is adopted, an important equation of Statics is the following: "Total Shear in any Story, times Story Height, equals the sum of the Moments at the top and bottom of all the Columns of that Story."

Useful formulas will now be derived on the basis of (1) $\Sigma M = 0$ at a joint and (2) $\Sigma M = 0$ in a story. Let joint N of a building frame subjected to a horizontal sidesway (d) represent the "near" end of any four members having I/L — values of K, K_1, K_2, and K_3; and with corresponding "far" ends at joints F, F_1, F_2, and F_3.

Since the members at joint N are in equilibrium under sidesway, we may apply $\Sigma M = 0$ at the joint. Then substituting in the Slope-Deflection equations, noting that each member rotates through the same angle (θ_N) at N, grouping terms, and solving, we have

$$\theta_N = \frac{3\Sigma K \frac{d}{h} - \Sigma K \theta_F}{2\Sigma K} \tag{1}$$

Dividing Eq. (1) in two parts, multiplying by E, and letting

$$x = E \frac{d}{h}$$

we have:

$$E\theta_N = \frac{3\Sigma Kx}{2\Sigma K} - \frac{\Sigma KE\theta_F}{2\Sigma K} \tag{2}$$

The first part of Eq. (2) is the total rotation at any joint (N) caused by the sidesway of the adjacent upper and lower stories as if the other ends were fixed; while the second part is the sum of the rotations brought over from the far ends of all the members meeting at joint N. It should be noted that the carry-over factor along any member is $-\frac{K}{2\Sigma K}$.

Assuming the rotation at the far ends equal, and the *same* as that at the near end (that is $\theta_F = \theta_N$); then Eq. (2) takes the form:

$$E\theta_N = \frac{\Sigma Kx}{\Sigma K} \tag{3}$$

If one member meeting at a joint is known to have its far end fixed, as at each of the upper joints of the first story of a frame fixed at the bottom, then Eq. (3) would be modified slightly, for these special cases.

(2) Let K, K′, etc. $= \frac{I}{L}$ - values of the columns in any story:

θ_U, θ_L, etc. = corresponding rotations at the upper and lower joints respectively;

d = sidesway of any story; that is, the sideswise deflection of upper floor relative to the lower;

$x = E\frac{d}{h}$ = sidesway quantity for that story;

M = story moment (but if frame is symmetrical about a vertical center line, M = one-half "total shear in story" times "story height", and only one-half of the columns are considered); and m = ⅙M.

If A, B, etc., are the columns in the story, we have:
for Column A,

$$M_U = 2\,EK\left(2\theta_U + \theta_L - 3\frac{d}{h}\right)$$

and

$$M_L = 2\,EK\left(2\theta_L + \theta_U - 3\frac{d}{h}\right)$$

for Column B

$$M_U' = 2\,EK'\left(2\theta_U' + \theta_L' - 3\frac{d}{h}\right)$$

and

$$M_L' = 2\,EK'\left(2\theta_L' + \theta_U' - 3\frac{d}{h}\right) \text{ ; etc.}$$

Adding the foregoing expressions, and applying $\Sigma M = 0$ to the columns in the story, we have

$$6K(E\theta_U + E\theta_L) + 6K'(E\theta_U' + E\theta_L') - \left(6E\frac{d}{h}\right)[2(K + K' + \ldots)] + M = 0$$

from which

$$x = E\frac{d}{h} = \frac{m + \Sigma K(E\theta_U + E\theta_L)}{2\,\Sigma K} \qquad (4)$$

In order to avoid possible confusion, it should be seen that Eqs. (1)-(3) include the K's of the members meeting at a joint; while Eq. (4) refers only to the K's of the columns in any story.

Label the joints and stories in consecutive order from the bottom upwards. Thus, let x_1 equal the sidesway quantity in the first story, x_2 equal that in the second story, etc.

The following steps are to be taken in carrying out the proposed method of analysis.

(1) Use Eq. (3) for finding the joint rotations in terms of the x's of the adjacent stories; set down the results in tabular form.

(2) Carry over the rotations from the far ends to the near end, using the factor, $\frac{K}{2\Sigma K}$.

(3) Apply Eq. (4) to each story and solve for x.

NOTE: Assuming as a first approximation, all the x's above any given story to be equal, not more than two equations need be solved simultaneously at a time even for multistoried frames.

(4) Knowing x for each story the joint rotations can be found by successive approximations and finally the desired bending moments can be calculated from the formula,

$$M_{NF} = -2K(3x - 2\theta_N - \theta_F) \qquad (5)$$

As a final check on the calculations, the girder moments at a joint should equal the sum of the column moments at that joint.

377TH MEETING, MAY 11, 1937

R. F. POOLE: *Progress in the Control of Plant Diseases.*

The following officers were elected for the year 1937-1938:

President—John N. Couch.

Vice-President—H. D. Crockford.

Secretary-Treasurer—E. L. Mackie.

The permanent secretary, E. T. Browne, and the editors of the Journal, W. C. Coker, Otto Stuhlman, and C. B. Beers, the last-named having been elected at the December meeting to fill the vacancy caused by the resignation of Dr. H. V. Wilson, were continued in office.

THE PHILOLOGICAL CLUB

OCTOBER 6, 1936

H. R. HUSE, *President*

A. E. ZUCKER, *Vice-President*

WERNER P. FRIEDERICH, *Secretary*

FRANCIS C. HAYES, *Treasurer*

SAMUEL SELDEN: *Kinæsthesis in Expressive Speech.*

The tonal changes which give words and phrases in vivid speech their "shape" and "color" have a physical, motor basis. It can be demonstrated that such expressions as "far," "near," "low," "great mountain," "grain of sand," "long, winding road," "short man," "smooth, cold marble," "whispering wind," "hope," "fear," and the like, have a stimulating effect on the listener's imagination in direct proportion to the speaker's sense of reaching, lifting, feeling around, pulling, pushing, etc. The muscular activity of the speaker may take the form of overt movements, or, more usually, of inner motor sets not visible outwardly.

The responses of the listener are emphatic. The more vital is the motor experience of the speaker while he is talking, the more vivid are the images sensed by the listener. Among the factors in the changing tones of the speaker which stimulate motor responses in the listener are tension-relaxtion, extension-contraction, pitch, loudness, voluminosity, inflection, and tempo. The theatre serves as an excellent laboratory for experimentations in expressive speech.

NOVEMBER 3, 1936

PRESTON C. FARRAR: *What Shall We Do About Shall and Will?* (For abstract, see *High School Journal*, November, 1936.)

DECEMBER 1, 1936

DOUGALD MACMILLAN: *The Larpent Collection of Plays in the Huntington Library.*

This paper is an informal description of the Larpent Collection of Plays in the Huntington Library, San Marino, California. The collection consists of copies submitted to the Examiner of Plays for license between 1737 and 1824. Though only a small proportion of the manuscript plays is unpublished, attention is called to the fact that except in rare cases does the manuscript in the collection agree with the printed text, discrepancies being often very marked. This point is illustrated by references to plays by James Thomson, David Garrick, Henry Jones, Henry Brooke, Samuel Foote, and others. Further it is noted that the collection contains examples of variant texts of individual pieces. Evidences of the

operation of the official censorship are described, and the relation of the Larpent texts to acting versions is considered. It is suggested that these versions represent in general the texts that were actually presented upon the stage.

JANUARY 12, 1937

JOSIAH C. RUSSELL: *Chroniclers of Medieval Spain.*

In the early part of the Middle Ages Spanish writers, such as Orosius and Isidore of Seville, were leaders in historiography and helped to fix the historical tradition for all of Europe. The invasion of the Moors diverted the course of Spanish chronicles from that of her northern neighbors. Among the Spanish Moors history flowered luxuriously under the patronage of rulers, but its limits were not sharply marked from religion, philosophy, geography, and biography. Among the Christians monastic history developed as meagre annalistic chronicles in contrast to the fuller chronicles of northern Europe. The Christian rulers, apparently imitating their Mohammedan rivals, patronized their historians and even wrote history themselves in the vernacular.

FEBRUARY 16, 1937

F. E. COENEN: *Wilhelm Raabe's Treatment of the Emigrant.*

An analysis of the emigrants in Wilhelm Raabe's novels and short stories dealing with his own time. Although a subject of the Duchy of Brunswick, the author, whose writings fall in the second half of the 19th century, was one of those progressive minds who realized the advantages of a united Germany under a strong but liberal leadership. His attitude in this matter is clearly reflected in almost all his writings, historical novels and short stories included.

While the attitude toward emigration was not unfavorable in the writings of many of the authors of the first half of the 19th century, Raabe's position shows a decided reaction as a careful examination of his emigrants (of whom there are only twenty-seven, many of whom play minor rôles, among his more than a thousand characters) reveals. With great consistency loyal patriots are rewarded with happiness, while those who love foreign lands are generally made to come to no good end. The author applies his poetic justice in a simple and direct way for the purpose of teaching patriotism.

MARCH 9, 1937

J. PENROSE HARLAND: *The Site of Troy.*

The Site of Troy has been a subject of controversy among both ancient and modern scholars. Until the time of Schliemann's excavations at Hissarlik (from 1870 on), Bali-Dagh (or Bunarbashi) was considered to be the most likely site of Priam's famous city. But, as a result of his

investigations and reading, Schliemann became firmly convinced that the Homeric Troy was at Hissarlik. For many the problem was solved: Troy was at Hissarlik.

In recent years M. Vellay has been bombarding the Hissarlik "camp" with books and articles in which he has produced cogent reasons for discarding this accepted identification. He has shown that the site of Hissarlik cannot possibly be reconciled with the evidence in the *Iliad* and *Odyssey*. Those who believe with M. Vellay that the *Iliad* is *history* and that every descriptive passage in it is the record of an eyewitness will be forced to reject the equation of Troy with Hissarlik. They may follow his plausible argument in favor of Bali-Dagh as the site of Homeric Troy.

But one who believes the *Iliad* to be the result of a long and gradual growth and to contain material from many periods and places will not look for agreement between the Iliad and a site. The Achaians apparently came into conflict with a well-fortified town in the Troad. Hissarlik may well have been that walled town which played such a part in the Hellenic Epics.

Bali-Dagh is admittedly a site better suited for the capital of a Trojan kingdom, but so far has yielded scanty evidence of its having played that part at the time of the Trojan War. On the other hand, however small and unsatisfactory a site Hissarlik may seem to have been, after all it was important enough to have been inhabited almost continuously from the Neolithic Age down into Byzantine times. But until definite proof as to the site of Troy is discovered—and I doubt if that will ever be—it seems better to refer to the important archæological site, excavated by Schliemann, not as Troy but as Hissarlik.

APRIL 27, 1937

A. E. ZUCKER: *The First German Hamlet.*

September 20, 1776, marks a significant date in the history of the German stage and of German literature: the première of *Hamlet* under Schröder's direction in Hamburg with Brockmann in the title rôle. Since eight other Shakespeare plays were put on by him during the next four years, it might be said that Schröder realized what Lessing had dreamed: the winning of Germany for Shakespeare. What this meant for German literature was stated succinctly by Tieck in 1826: "Shakespeare's plays form the first and the soundest foundation of our more recent drama; our newest literature originates with him as the Greek did with Homer."

The version played was that of Schröder written in clear, unpoetical prose, with alterations in Shakespeare's text in conformity with current ideas on the value of the unities of time and place, as well as of "poetic justice." Thus *Hamlet* was given a happy ending, in much the same manner as English producers of the time "improved" Shakespeare. The acting of Brockmann was modeled to some extent on descriptions of Gar-

rick as Hamlet. Also in keeping with the time was the rather *larmoyant* presentation of the title rôle. Schröder himself played the part of the ghost in this production, following out his principles that the production as a whole was important and not his own appearance as star.

MAY 3, 1937. JOINT MEETING WITH ERASMUS CLUB AT DUKE UNIVERSITY

PROFESSOR LOWMAN: *The Linguistic Atlas of the United States and Canada.*

SOCIETY OF THE SIGMA XI (North Carolina Chapter)

President, ARCHIBALD HENDERSON; *Vice-President,* ENGLISH BAGBY; *Secretary-Treasurer,* R. W. BOST; *Member of Executive Committee,* C. D. BEERS; *Member of Nominating Committee,* E. L. MACKIE.

NOVEMBER 24, 1936

W. F. PROUTY, Professor of Geology, University of North Carolina.

Meteorite Scars and Carolina Bays.

FEBRUARY 18, 1937

JOHN R. DUNNING, Professor of Physics, Columbia University.

The Neutron and Atomic Transmutations.

MAY 26, 1937

ARCHIBALD HENDERSON, Professor of Mathematics, University of North Carolina.

A Classic Problem in Euclidean Geometry from a New Point of View.

Four members and eighteen associate members were initiated into the Society during the year.

RESEARCH PUBLICATIONS

THE JOURNAL OF THE ELISHA MITCHELL SCIENTIFIC SOCIETY

Volume 52, 2—December, 1936

Proceedings of the Thirty-fifth Annual Meeting of the North Carolina Academy of Science 133
Proceedings of the Elisha Mitchell Scientific Society 167
Estuarine Animals at Beaufort, North Carolina. *A. S. Pearse* 174
Raciation in Steniridia Andrewsi Harris, a Supplement to Speciation in Steniridia. *J. M. Valentine* 223
Notes on the History of the Germ Cells in the Toadfish (Opsanus tau). *Eugene P. Odum* 235
More Primitive Moss-Mites of North Carolina. *Arthur Paul Jacot* 247
Oribata and Belba from Florida (Acarina, Oribatinæ). *J. W. Wilson* 255
The Incubation of Hen Eggs Under Increased Atmospheric Pressure. *Bert Cunningham* 269
Heterothallism and Sterility in Achlya and Observations on the Cytology of Achlya bisexualis. *John Robert Raper* 274
A New Species of Rhipidium from Mountain Lake, Virginia. *Velma D. Matthews* 291
The Genus Cyperus in North Carolina. *Mildred Stites Reed* 295
Spermatogenesis in Marsilea. *A. G. Lang* 307

Volume 53, 1—July, 1937

Southern Appalachian Grass Balds. *B. W. Wells* 1
Notes on Mayflies of the Southeastern States. (Ephemeroptera). *Jay R. Traver* 27
The Formation of New Siphon Openings in the Tunicate, Styela plicata. *W. C. George* 87
Anophthalmid Beetles (Fam. Carabidæ) from Tennessee Caves. *J. Manson Valentine* 93
A Cytological Study of the Skin Glands of the Dusky Salamander. *Mary Idolene McManus* 101
Technique in the Preparation of Chick Embryos for Class Use. *C. D. Beers* 115
Observations on the Development and Cytology of the Sexual Organs of Thraustotheca clavata (de Bary) Humph. *Leland Shanor* 119
The Occurrence of Liparis Loeselii and Habenaria bracteata in North Carolina. *Lane Barksdale* 137
The Orchids of North Carolina. *Donovan S. Correll* 139
Studies in the Life History of Nitella hyalina Agardh. *Laurie M. Stewart* 173
A New Genus of the Blastocladiaceæ, *Velma Dare Matthews* 191
A New Species of Rozella Parasitic on Allomyces. *Frances K. Foust* 197

CONTENTS OF STUDIES IN PHILOLOGY

OCTOBER, 1936—OCTOBER, 1937

Volume XXXIII, 4—October, 1936

Burton's Influence on Ford's *The Lover's Melancholy*. *G. F. Sensabaugh.*
Eighteenth Century Correspondence: A Survey. *Richmond P. Bond.*
Falsetto in Shelley. *Sister M. Eunice Mousel.*
Browning's Heresies. *C. R. Tracy.*
Robert Browning, Dramatist. *Arthur E. DuBois.*
Ferrara and *My Last Duchess*. *Louis S. Friedland.*
Announcement—American Council of Learned Societies.

Volume XXXIV, 1—January, 1937

In Memoriam—George Howe.
Chaucer's Aphorisms from Ptolemy. *Karl Young.*
The Man of Law's Head-Link and the Prologue of the Canterbury Tales. *Carleton Brown.*
A Late Fifteenth-Century Revision of Mirk's "Festival." *Lillian L. Steckman.*
French *Aumusse*, English *Amice*. *George C. S. Adams.*
A Note on the Arouet > Voltaire Problem. *Lawrence M. Levin.*
Byron and English Interest in the Near East. *Wallace Cable Brown.*
Heine Manuscripts at Yale: Their Contribution Concerning Him as Man and Artist. *Hermann J. Weigand.*
Hawthorne and the Civil War. *Randall Stewart.*

Volume XXXIV, 2—April, 1937

Spenser and the Italian Myth of Locality. *Rudolf B. Gottfried.*
Swooning in the *Fœrie Queene*. *Zaidee E. Green.*
Spenser on the Regiment of Women: A Note on the *Fœrie Queene*, V, v. 25. *Neill Kerby.*
Spenser and Mediæval Mazers; with a Note on Jason in Ivory. *Rosemond Tuve.*
Samuel Daniel in France and Italy. *Mark Eccles.*
The Date of Shakespeare's *Hamlet*. *Leo Kirschbaum.*
The Occasion of *King Lear*. *John W. Draper.*
Richard Johnson's Borrowed Tears. *Franklin B. Williams.*
Commentaries on Genesis as a Basis for Hexæmeral Material in the Literature of the Late Renaissance. *Arnold Williams.*
The Astronomy of *Paradise Lost*. *Grant McColley.*
The French Renaissance Gallicized: An Emphasis on National Tradition. *W. L. Wiley.*
Recent Literature of the English Renaissance. *Hardin Craig, David Patrick*, and *William Wells.*

Volume XXXIV, 3—July, 1937

The Influence of Senecan Tragedy in the Plays of Juan de la Cueva. *Edwin S. Morby.*

Ben Jonson the Actor. *Fredson Thayer Bowers.*

Charles Johnson's *The Force of Friendship* and *Love in a Chest:* A Note on Tragi-comedy and Licensing in 1710. *Edward Niles Hooker.*

Cato's Obscure Counterpart in *The British Journal,* 1722-1725. *Paul Bunyan Anderson.*

Wordsworth's Relation to Coleridge's *Osorio. Marie Padgett Hamilton.*

Carlyle's Fusion of Poetry, History, and Religion by 1834. *Hill Shine.*

The Sources of Browning's *Sordello. Stewart W. Holmes.*

A Substitute Religion: The Source of Vigny's Optimism. *S. H. Clarke.*

THE NORTH CAROLINA LAW REVIEW

Volume XV, 1—December, 1936

Law Enforcing Officers in North Carolina. *Albert Coates.*

Utilities Commissions As Expert Courts. *Frank W. Hanft.*

Volume XV, 2—February, 1937

The Law of Arrest in North Carolina. *Albert Coates.*

Attack on Decrees of Divorce by Second Spouses. *Albert C. Jacobs.*

The Reformation of Writings Under the Law of North Carolina. *Wex S. Malone.*

Volume XV, 3—April, 1937

Limitations on Investigating Officers. *Albert Coates.*

Outline of the Gold Clause Cases. *Angus D. MacLean.*

The Defaulting Plaintiff in North Carolina. *John E. Mulder.*

Volume XV, 4—June, 1937

A Survey of Statutory Changes in North Carolina in 1937. *Members of the Law School Faculty.*

SOCIAL FORCES

Volume 15, 1—October, 1936

Some Methods of Studying Race and Culture. *Floyd N. House.*

Regions. *William F. Ogburn.*

Standardization of Federal Administrative Regions. *James W. Fesler.*

The Southern Crisis and Social Control. *Wayland J. Hayes.*

The Social Scientist in the Tennessee Valley Authority Program. *T. Levron Howard.*

The University and Social Planning: I. Beginnings at the University of Illinois. *Rexford Newcomb.*

The University and Social Planning: II. Cooperative Research in Territorial Planning: The Kaskaskia River Valley Study in Illinois. *W. Russell Tylor.*

Twelve other articles in the departments of Teaching and Research in the Social Sciences; Public Welfare and Social Work; Community and Neighborhood; Marriage and the Family; Race, Cultural Groups, Social Differentiation; Government, Politics, Citizenship.

Volume 15, 2—December, 1936

European and American Sociology: Some Comparisons. *Earle Edward Eubank.*

Henry Hughes, First American Sociologist. *L. L. Bernard.*

The Letters of Albion W. Small to Lester F. Ward: III. Edited by *Bernhard J. Stern.*

Federal-State Relations in Planning. *James E. Pate.*

Whither Agrarian Economy in the United States? *Louis Bernard Schmidt.*

Racial Factors and Economic Forces in Land Tenure in the South. *Monroe N. Work.*

Fourteen other articles in the departments of Teaching and Research in the Social Sciences; Public Welfare and Social Work; Marriage and the Family; Race, Cultural Groups, Social Differentiation; Government, Politics, Citizenship.

Volume 15, 3—March, 1937

The Letters of Albion W. Small to Lester F. Ward: IV. Edited by *Bernhard J. Stern.*

The Errors of Sociology. *Howard W. Odum.*

The "Drag" of Talent Out of the South. *Wilson Gee.*

Capital in Relation to Optimum Population. *Howard Bowen.*

Eleven other articles in the departments of Teaching and Research in the Social Sciences; Public Welfare and Social Work; Community and Neighborhood; Race, Cultural Groups, Social Differentiation; Government, Politics, Citizenship.

Volume 15, 4—May, 1937

The Subject Matter and Methods of Social Psychology: A Symposium.

I. Introduction: The Hanover Round Table and Social Psychology of 1936. *Floyd H. Allport.*

II. Past and Present Trends in the Definition and Subject Matter of Social Psychology. *Steuart Henderson Britt.*

III. The Rôle of Individual Psychological Differences in Social Psychology. *Catharine Cox Miles.*

IV. Personality and Social Adjustments. *Gardner Murphy.*

V. The Observation of Children's Behaviors as a Method in Social Psychology. *Florence L. Goodenough.*

VI. Attitude Measurement as a Method in Social Psychology. *Daniel Katz.*

VII. The Field-Theoretical Approach in Social Psychology. *J. F. Brown.*

VIII. The Observation of Societal Behaviors of Individuals. *Floyd H. Allport.*

IX. The Comparative Approach to Social Behavior. *A. H. Maslow.*

X. The Need and Opportunity for Experiment in Social Psychology. *J. F. Dashiell.*

XI. Administrative and Professional Vocations as Fields for Social Psychology. *Edward S. Robinson.*

XII. The Effect of Modern Technology and Organization Upon Behavior. *Hadley Cantril.*

Eleven other articles in the departments of Teaching and Research in the Social Sciences; Public Welfare and Social Work; Community and Neighborhood; Race, Cultural Groups, Social Differentiation; Government, Politics, Citizenship.

THE UNIVERSITY NEWS LETTER

FEATURE ARTICLES

State and Local Taxation in North Carolina, 1936-1937.

Life Insurance in the United States.

Industry in North Carolina, 1935.

Income in the United States by States.

Building and Loan Associations in the United States, 1935.

Know North Carolina, 1936.

Life Insurance in the United States by States, 1935.

Assessed Valuation and Tax Rates in North Carolina, 1936.

Motor Vehicles in the United States by States, 1936.

County Health Work: United States and North Carolina.

Industry in the United States by States, 1935.

Bank Deposits per Capita in North Carolina, 1936.

Homicides in the United States, by States, 1934-1935.

Inhabitants per Physicians in the United States, by States, 1936.

Per Inhabitant Income by States, 1935.

Farm Real Estate Taxes, by States, 1935.

Equity in Farm Real Estate, by States, 1935.

Mobility of Farmers in the United States, by States, 1935.

Education and Motor Cars, 1935-1937.

State Support of Public Health in the United States, 1936-1937.

School Expenditures in the United States and North Carolina, 1929 to 1935.

Retail Trade in North Carolina, 1935.

THE SOUTHERN ECONOMIC JOURNAL

Volume III, 2—October, 1936

Some International Aspects of Capitalism and Its Present Crisis. *Herbert von Beckerath.*
Southern Quackery. *Broadus Mitchell.*
National Economic Planning: The American Tradition. *D. Clarke Hyde.*
Fundamental Principles of Profit. *Montgomery D. Anderson.*
Wage Rates and Hours of Labor in North Carolina Industry. *H. M. Douty.*
Direct Price Fixing. *Jules Backman.*

Volume III, 3—January, 1937

The Public Service and the Professional Social Scientist. *James W. Martin.*
Who Paid the Processing Taxes — the First Time? *Wirth F. Ferger.*
Economic Effects of the New Deal Tax Policy. *Truman C. Bigham.*
Relief in the Rural South. *Howard B. Myers.*
The Place of Social Security in Our Modern Economic Life. *Harry D. Wolf.*
Social Security in the South. *Frank T. de Vyver.*

Volume III, 4—April, 1937

Forests in the Economy of the South. *E. L. Demmon.*
The Rust Cotton Picker. *Ralph C. Hon.*
Population Problems in the South — Part I. *Joseph J. Spengler.*
The Situation in Chain-Store Distribution. *Wilford L. White.*
The Problem of Trade-Union Structure in the United States. *H. M. Douty.*
Graphic Presentation of Trend Data. *E. M. Bernstein* and *Dudley J. Cowden.*

Volume IV, 1—July, 1937

Population Problems in the South — Part II. *Joseph J. Spengler.*
South Carolina Cash Depositories. *W. H. Steiner.*
Marginal Productivity Versus Classical Rent. *Montgomery D. Anderson.*
The Settlement of Certain State Claims Against the Federal Government. *B. U. Ratchford.*
Production Controls. *Jules Backman.*

THE CAROLINA PLAY-BOOK

Volume IX, 3—September, 1936

A Negro Sharecropper play. *Frederick H. Koch.*
"New Nigger", a tragedy of the tobacco country. *Fred Howard.*
A Prologue for "The Drunkard," a poem. *Josephina Niggli.*
Communal Playmaking. *Frederick H. Koch.*
Illustrations: A scene from "New Nigger," three Carolina Playmaker playwrights.

Volume IX, 4—December, 1936

A New Mexican Play. *Josephina Niggli.*
Maximilian and Carlotta, excerpts from the play. *Josephina Niggli.*
"The Fair-God," a scene from the play. *Josephina Niggli.*
"Singing Valley", a scene from the play. *Josephina Niggli.*
"Texas Calls." *Walter Spearman.*
An American National Theatre. *Frederick H. Koch.*
Festival of Youth, a poem. *Marjorie Craig.*
Eighteenth Season. *Frederick H. Koch.*
Empathy. *Samuel Selden.*
Illustrations: A scene from "The Fair-God," Maximilian of Mexico.

Volume XI, 1—March, 1937

Nancy Hanks. *Frederick H. Koch.*
"Leavin's," a play. *Janie Malloy Britt.*
Mildred Seydell Says. *Mildred Seydell.*
The Festival, 1937. *Robert Finch.*
Carolina Drama. *Gerald Johnson.*
Drama Festival. *Bernice Kelly Harris.*
The Tournament Winners.
Stadia and Night. *Phillips Russell.*
Illustrations: A scene from "Leavin's." *Nancy Hanks and Abraham Enloe.*

Volume X, 2—June, 1937

The Drama of Roanoke. *Frederick H. Koch.*
Scenes from "'The Lost Colony," a pageant-drama. *Paul Green.*
Excerpts from "Raleigh, the Shepherd of the Ocean," a pageant-drama. *Frederick H. Koch.*
"Androcles and the Lion." *Archibald Henderson.*
Shaw in the Forest. *Phillips Russell.*
The Touring Equipment of The Carolina Playmakers. *Harry E. Davis.*
Illustrations: Federal Theatre Actors, Playwright and Directors of "The Lost Colony"; scene from "Androcles and the Lion."

SOUTH ATLANTIC BULLETIN

(Supported by the South Atlantic Modern Language Association and the University of North Carolina)

Volume II, 1—April, 1936

Book reviews: Willard E. Martin, *A Chaucer Bibliography* (J. M. Steadman, Jr.); Nancy Stewart, *La vie et l'oeuvre d' Henri de Bornier* (R. W. Linker); John A. Strausbaugh, *The Use of* auer a *and* auer de *as Auxiliary Verbs in Old Spanish* (L. L. Barrett); Lucile K. Delano, A Critical Index of *Sonnets in the Plays of Lope de Vega* (Marshall E. Nunn).

Volume II, 2—October, 1936

Book reviews: William Stanley Poole, *A Check-List and Finding List of Charleston Periodicals*, 1732-1864 (Thomas H. English; A. P. Hudson, *Humor of the Old Deep South* (Sturgis E. Leavitt).

Volume II, 3—December, 1936

Book reviews: William F. Thrall and Addison Hibbard, *A Handbook to Literature* (J. M. Steadman, Jr.); A. P. Hudson, *Folksongs of Mississippi* (Alton C. Morris).

Volume II, 4—February, 1937

Work of the Committee on Resources of Southern Libraries. Wilmer L. Hall.

Book reviews: Phillips Russell, *The Glittering Century* (Thomas H. English); Richmond Croom Beatty, *Bayard Taylor* (T. Walter Herbert); Richmond P. Bond, *Chesterfield* (Gordon Watson).

Volume III, 1—April, 1937

Research Clubs. S. A. Stoudemire.

Works of Art in Madrid. Homero Serís.

The Southern Folklore Quarterly. A. P. Hudson.

Chapel Hill As I Knew It. Y. Z. Chang.

Annual Bibliographies for English. Thomas H. English.

The Course in Bibliography. Gregory Paine.

Book reviews: Nettie S. Tillet, *How Writers Write* (Paull F. Baum); R. S. Boggs, *Outline History of Spanish Literature* (Karl E. Shedd); Herbert W. Sugden, *The Grammar of Spenser's Fœrie Queene* (W. P. Cumming); Paull F. Baum, *Rossetti: Poems, Ballads and Sonnets* (Garland G. Smith); Robert B. Sharpe, *The Real War of the Theaters* (Rupert Taylor).

Part IV

FACULTY PUBLICATIONS WITHOUT DIGESTS

R. S. Boggs. *Outline History of Spanish Literature.* Boston: D. C. Heath and Co. 1937. 154pp.

Lee M. Brooks. Slums of Midas or the Housing of Demos? *Social Forces,* **15:** 3. 1937. (A review of *Slums and Housing,* 2 vols., by James Ford.)

Henry M. Burlage. Laboratory Manual for Pharmaceutical Technique. Parts I and II (revised). Chapel Hill. 1936. Laboratory Manual for Galenical Pharmacy. Parts I and II (revised). Chapel Hill. 1937.

Wallace E. Caldwell. *The Ancient World.* New York: Farrar and Rinehart. 1937. A text-book on Ancient History intended for Colleges.

B. W. Davis edited the Latin Column in the *High School Journal* during the school year 1936-1937.

Robert B. Downs. The Game of Book Collecting. *Carolina Magazine,* March, 1937, pp. 26-28. Review of W. S. Hoole's *Checklist and Finding List of Charleston Periodicals,* 1732-1864. *North Carolina Historical Review,* XIV: 205-207. 1937.

Review of Louis Round Wilson's *Library Trends. Social Forces,* **16:** 145-147. 1937.

E. E. Ericson. *Notes and Queries* for 1937: Folklore of Teeth, **172:** 214; Fatherhood at an Advanced Age, **172:** 196; Symbols for American Political Parties, **172:** 244; Surviving Folklore: Umbrella, **172:** 266; Phrase: The Band Begins to Play, **172:** 377; An American Unicorn, **172:** 386; The Oregon Boot, **172:** 463; The Queen's Shilling, **173:** 248. Newspaper Articles: Layovers for Meddlers. *Greensboro News,* July 18, 1937; Home-made Words. *Fayetteville Observer,* November 10, 1936; Rear or Rare? *Raleigh News and Observer,* January 5, 1937.

Preston C. Farrar. *Shall* and *Will* in Recent Text-books. *High School Journal,* December, 1936. An Experience Curriculum in English. *High School Journal,* April, 1937.

ERNEST R. GROVES. Building Honesty in the School Child. *Parent-Teacher Magazine,* XXXI: 2: 6-7, 24. October, 1936. The Telling of Lies by Children. *Country Home Magazine,* October, 1936. Physiological and Sociological Aspects of Sex. *Social Forces,* **15:** 130-132. October, 1936. Marriage Counseling and Birth Control. *Birth Control Review,* IV: 4: 1-2. December, 1936. Getting Acquainted with Children. (With GLADYS HOAGLAND GROVES.) *Parents' Magazine,* July, 1937. When He Comes A-courting. *Good Housekeeping Magazine,* September, 1937. Teaching Marriage at the University of North Carolina. *Social Forces,* **16:** 87-96, October, 1937. Mental Hygiene. *Social Forces,* **16:** 138-140. October, 1937.

A. C. HOWELL. *The Preparation of Reports* (Second Edition, Completely Revised.) In collaboration with RAY PALMER BAKER of Rensselaer Polytechnic Institute. New York: The Ronald Press (In Press). Short Bibliography of Reports Useful in Teaching Elements of Report Writing, *Journal of Engineering Education,* New Series, XXVII: 340-344. December, 1936.

V. A. HOYLE. *Freshman Mathematics.* Ann Arbor, Michigan: Edward Bros., 1937. (With E. L. MACKIE.)

ARTHUR PALMER HUDSON. *Functional College Composition,* Vol. II, New York: Thomas Y. Crowell Company. 1936. (In collaboration with E. H. HARTSELL and W. L. WILSON.) This book has been completely revised and considerably enlarged, and will be published in a second, one-volume edition by the same publisher in the spring of 1938. Editor, *Nelson's College Caravan,* Vols. III and IV, New York: Thomas Nelson and Sons. 1936. (In collaboration with L. B. HURLEY, Woman's College of the University of North Carolina, and J. D. CLARK, State College of the University of North Carolina.)

RICHARD JENTE. (With E. P. HOFACKER.) Complete College German. Part I: An Introduction to German; Part II: A Complete Grammar Review. New York: D. C. Heath & Co. 1938.

GUY B. JOHNSON. Books on Race and Race Relations. *Social Forces,* **15:** 580-583. May, 1937. Book reviews in *Pacific Affairs,* March, 1937; *American Journal of Sociology,* May, 1937; *Annals of the American Academy of Political and Social Science,* March, 1937.

A. M. JORDAN. The Use of Moving Pictures in Instruction. *High School Journal,* May, 1937.

LUCILE KELLING. Adventures Around the World. *University of North Carolina Extension Bulletin,* III: 1. 1936.

FREDERICK H. KOCH. Directing Author and Editor *A Century of Culture,* a communal drama commemorating the centennial of public education in North Carolina. Durham, North Carolina: The Seeman Printery. Editor *The Carolina Play-Book,* a quarterly journal published by The Carolina Playmakers. Articles in *The Play-Book:* A Negro Sharecropper Play, IX: 3. 1936; Communal Playmaking, IX: 3. 1936; Eighteenth Season, 1935-1936, in Review, IX: 4. 1936; An American National Theatre, IX: 4. 1936; Nancy Hanks, X: 1. 1937; The Drama of Roanoke, 1587-1937, X: 2. 1937. Raleigh, the Shepherd of the Ocean, X: 2. 1937. *Backstage,* a Federal Theatre Project publication: Toward a National Theatre, II: 6. 1936; The Lost Colony on Roanoke Island, II: 7. 1937. *The Carolina Stage,* published by The Carolina Dramatic Association: Communal Pageantry, II: 1. 1936; Last Call, II: 5. 1937; Festival of Youth, II: 6. 1937. *North Carolina Education:* Centennial Pageant Making, November, 1936; A Festival of Youth, April, 1937. *The Lost Colony,* an illustrated souvenir program-book: The Drama of Roanoke, July, 1937. *Stage Management for the Amateur Theatre,* by William P. Halstead: Editor's Foreword, 1937.

GEORGE S. LANE. Report on Indo-European Linguistics. *American Year Book,* 1936, pp. 818-820.

WM. DEB. MACNIDER. The Ideal Nurse. *The Health Bulletin,* North Carolina State Board of Health, **52:** 4. 1937. The Biologically Minded Physician. *Science,* **86:** 109. 1937.

E. L. MACKIE (with V. A. HOYLE). Freshman Mathematics. Ann Arbor: Edwards Bros. (Planographed.) 1937. (In use in the Department of Mathematics for freshmen in the General College, University of North Carolina.)

ROBEN J. MAASKE. *Questions and Exercises for Americanization Classes.* Salem, Oregon: State Department of Education. 1936. 47 pp. (In coöperation with M. F. WANZER, consultant.) *Oral and Written Exercises for Americanization Classes, Part A.* Salem,

Oregon: State Department of Education. 1936. 39 pp. (In cooperation with M. F. WANZER, consultant.) *Oral and Written Exercises for Americanization Classes, Part B.* Salem, Oregon: State Department of Education. 1936. 38 pp. (In coöperation with M. F. WANZER, consultant.) *Oregon Manual for Americanization Teachers.* Salem, Oregon: State Department of Education. 1937. (In coöperation with M. F. WANZER, consultant.) *Conversation Lessons for Adult Americanization Classes.* Salem, Oregon: State Department of Education. 1937. (In coöperation with M. F. WANZER, consultant.)

ELWYN A. MAUCK. Erie County, N. Y., Deals in Real Estate. *National Municipal Review,* New York, October, 1936.

HAROLD D. MEYER. The 1937-1938 Parent-Teacher Congress program for the State of North Carolina. General Topic—Social Security. Program Notes appearing in four issues of the State Parent-Teacher *Bulletin.* Forcefulness. *National Parent-Teacher Magagine.* January, 1937.

HARRY ESTILL MOORE. Five Theoretical Contributions. *Social Forces,* **15**: 570-575. May, 1937.

HOWARD W. ODUM. Planning for the State's Welfare. *The Public Welfare News Letter,* North Carolina State Board of Charities and Public Welfare, Raleigh, N. C., October, 1936. Six Americas in Search of a Faith. *Independent Woman,* XV: 10: 309, 334-336. October, 1936. Social Security and Public Welfare in the 30's. *Minutes and Materials* of the Second Annual Institute of the North Carolina State Employment Service and National Reëmployment Service, 1936. These Southern Regions. *Alabama School Journal,* **54**: 9. May, 1937. From Sections to Regions. A critique of *The Road to Reunion,* by Paul H. Buck. *The Saturday Review of Literature,* XVI: 7: 5. June 12, 1937. Prepared and edited with the assistance of HARRIET L. HERRING and DON BECKER, *Security and Welfare. Which Way Is Forward for North Carolina?* Marking the Twenty-fifth Anniversary of the North Carolina Conference for Social Service, January, 1937.

GREGORY L. PAINE. The Course in Bibliography. *South Atlantic Bulletin,* III: 4: 14. April, 1937. A mimeographed Style Sheet for Term Papers, Theses, and Dissertations. The Book Exchange: University of North Carolina.

CARLETON E. PRESTON. *High School Journal* (Science Column): What, or How? November, 1936; As Told by Student Answers, January, 1937; Improving Science Meetings, February, 1937; Adjusting the Biology Course, March, 1937; Concerning Reference Work, April, 1937.

HERMAN STAAB. (With PROFESSOR HUGO GIDUZ.) *Commercial French,* a text-book in preparation. (With PROFESSOR HUGO GIDUZ.) A *Reader* containing extracts from modern French economists and sociologists.

RUPERT B. VANCE. The South — Population Seedbed of the Nation. In the series, "The South Today." Southern Newspaper Syndicate Release to the Press, August 15, 1937. Book reviews in *American Sociological Review* and *Social Forces.*

JOHN B. WOOSLEY. The Changing Bond Account. *The Tar Heel Banker,* XVI: 1: 20-24. 1937.

INDEX

INDEX OF NAMES

PAGE

Adams, G. C. S. 108
Adams, G. E. 10
Adams, Nicholson B. 109, 111
Adams, Raymond 51
Anderson, Edward Hutchings 34
Andrews, James C. 12
Andrews, Kathleen Crandall 12, 13
Anson, C. P. 31
Armold, Dean 50
Ashby, Richard 136, 139
Aycock, William Brantley 73

Baer, Reinhold 84, 85
Bagby, English 140, 151
Bailey, J. O. 51
Bailey, Robert K. 119
Baity, Herman G. 105, 106, 107
Baker, Ray Palmer 161
Bancroft, W. D. 23
Barnes, F. J. 101
Barrett, J. A. 107
Barrett, L. L. 107, 110
Barrier, Katherine Lewis 118, 127
Bartz, W. F. 15
Baynes, Eloise 27
Bayroff, A. G. 103
Beale, Howard K. 67, 68, 72, 78
Becker, Don 163
Beckerath, Herbert von 32
Beckwith, James Payne 128
Beech, Gould 122
Beers, C. D. 132, 147, 151
Benson, J. McLean 127
Berdan, Helen 10
Bernhart, Gerd W. 27
Bernstein, E. M. 32, 33
Berwanger, Sybille 101
Bitting, Mary Elizabeth 55
Blackwell, R. C. 83
Blankenburg, William Luther 59
Boggs, R. S. 109, 110, 116, 160
Bond, R. P. 48, 51, 52, 54
Booker, John M. 46
Bost, Ralph W. 19, 22, 140, 151
Brammer, Forest E. 95
Branch, Mary Sydney 122
Breckenridge, M. S. 79
Breibart, Solomon 67
Brooks, Cullen Paul 86
Brooks, Lee M. 122, 128, 134, 138, 160
Browder, W. G. 118, 136

PAGE

Brown, D. A. 48
Browne, E. T. 83, 84, 140, 147
Brown, Roy M. 118, 127
Buchanan, D. H. 31
Buck, C. D. 64
Bunting, F. H. 30
Burdette, P. H. 15
Burlage, H. M. 90, 91, 160
Burlage, Mrs. H. M. 9
Burling, L. D. 60, 61
Burwell, Convere Jones 93

Caldwell, James Roy, Jr. 74
Caldwell, W. E. 76, 160
Cameron, E. A. 141
Cameron, Frank K. 14, 15, 16
Cannon, C. V. 22, 98
Carroll, Charles Lemuel, Jr. 87
Carroll, Rachel 74
Cason, Ernest Wesley 75
Cauthen, Charles Edward 69
Cavers, David F. 80
Chapman, Martha Corbitt 75
Chatham, Katherine 67
Cheek, Atlas Lawrence 113
Chute, Charlton F. 100
Clanton, B. R. 15
Clark, J. D. 161
Coates, Albert 79
Cobb, Mabel Benner 114
Coenen, F. E. 65, 149
Coffman, George R. 46, 57, 58
Coker, R. E. 131
Coker, W. C. 8, 9, 11, 147
Congleton, James Edmund 52
Constable, E. W. 131
Conte, L. B. 14
Cook, James Filmore 65
Cornsweet, Albert C. 104
Costello, D. P. 132, 133, 142
Costello, Helen M. 133
Couch, J. N. 9, 10, 11, 147
Cowden, Dudley, J. 32, 33
Cox, Rufus Carson, Jr. 38
Craigie, Sir William 50
Crockford, H. D. 19, 147
Crouch, George 96
Croxton, F. E. 33
Culp, F. B. 15

Daggett, G. H. 46
Dashiell, J. F. 101, 102, 104, 142
Davis, B. W. 26, 160
deBerry, Nena 43
Devol, Lee 95
Dey, William M. 107, 113, 114

PAGE

Dichmann, Mary Ethel 50
Di Costanzo, N. 83
Doan, Effie Estelle 128, 137
Dobbins, James T. 17, 23, 24
Donovan, C. H. 30
Dorsett, Henry Grady 98
Downs, J. A. 107
Downs, Robert B. 81, 82, 160
Driscoll, R. L. 95
Dunning, John R. 151
DuPuis, Elroy 56
Durham, Francis Marion 27

Eakins, M. H. 31
Eaton, Mary Alice 122
Edwards, Henry Leitner 17, 23, 24
Edwards, Martha E. 122
Edwards, R. A. 61
Einarsson, Stefan 50
Eldridge, Carey DeWitt 108, 114
Eliason, Mary 46
Emory, Samuel T. 62
Engels, W. L. 133
Erickson, Franklin C. 61
Ericson, E. E. 48, 49, 50, 160
Ericson, Ervid E. 49
Evans, Kenneth 122
Everett, J. E. 21
Ezell, W. C. 118

Farrar, Preston C. 41, 148, 160
Fenn, D. F. 139
Ferrill, H. Ward 99, 143
Fesler, James W. 100, 101
Fincher, J. A. 131
Fisher, Elizabeth 51
Fletcher, James Floyd 38
Ford, Dorothy 50
Foster, G. H. 48
Foust, Frances 10
Friederich, Werner P. 64, 65, 148
Frierson, David Ethan 110

Galloway, Leon 22
Gardner, Rosalyn Howard 114
Garrett, Mitchell B. 76
Gass, E. C. 101
Gates, Harriet 122
Geisert, H. L. 118, 136
George, W. C. 7, 144
Geyer, John C. 106
Ghigo, Francis 115
Gibson, Edward Hiram, III 75
Giduz, Hugh 41, 164
Godbold, Lucile Ayers 129
Gordy, Walter 97

PAGE
Gotaas, Harold B. 107
Green, Fletcher M. 67, 69, 78
Greene, Esther 63
Griffin, M. L. 46
Groseclose, F. F. 60
Groves, Ernest R. 119, 123, 124, 127, 129, 130, 135, 138, 139, 161
Groves, Gladys Hoagland 161
Grubb, Gerald G. 46

Hagood, Margaret Jarman 122, 123, 139
Hagood, M. J. 47
Hall, L. B. 106
Hamer, Beverly Du Bose 27
Hamilton, J. G. deR. 71
Hammond, E. A. 68
Hammond, W. S. 8
Hanft, F. W. 79, 81
Hanrahan, Kirkwood L. 119
Hansen, Peter 88
Hardré, René 42
Harland, J. Penrose 24, 25, 149
Harper, Frances 66
Harrer, G. A. 24, 25, 26
Hartsell, E. H. 161
Hassell, James Woodrow 115
Hatch, H. T. 15
Hawthorne, John J. 89
Hawthorne, Manning 56
Haydon, Glen 88
Hayes, F. C. 109, 110, 148
Hayes, Wayland J. 134, 138
Healy, E. D. 108, 115
Heath, M. S. 33
Heer, Clarence 30
Heironimus, J. P. 68
Henderson, Archibald 82, 151
Herring, Harriet L. 122, 136, 137, 163
Hickerson, T. F. 59, 140, 144
Hicks, Earl 33
Hobbs, R. J. M. 30
Hobbs, S. H., Jr. 117, 118
Hodge, Mary W. 95
Hodges, John Kennedy 19
Hofacker, E. P. 161
Holder, Brantson Beeson 35
Holland, Alma 9
Holmes, Urban T. 50, 108, 109, 110, 114, 115, 117
Holman, Russell L. 89
Honeyman, H. L. 68
Hornbeck, Ross Wright 63
Horner, G. F. 47
Howell, A. C. 48, 161
Howell, W. W. 29
Howerton, H. B. 101
Hoyle, V. A. 84, 161, 162
Huddle, John W. 61, 63

PAGE

Hudson, Arthur Palmer 47, 58, 161
Hulme, Francis P. 46
Hunter, Ida Louise 27
Hurley, L. B. 161
Huse, H. R. 109, 148

Irwin, William H. 62

Jacobs, M. L. 90, 91
Jacobson, N. 86
Jenkins, William S. 100, 101
Jente, Richard 64, 161
Jocher, Katharine 119, 123, 128, 129, 134, 137
Johnson, Cecil 69
Johnson, Mrs. Cecil 9
Johnson, Elizabeth 87
Johnson, Guy B. 123, 137, 161
Johnson, J. Herman 122
Johnson, R. P. 24, 25
Johnson, W. R., Jr. 62
Jones, C. C. 95
Jones, Idelle 50
Jordan, A. M. 41, 162

Kampschmidt, William Henry 76
Karlin, Jules Alexander 76
Katsoff, Louis Osgood 92, 93
Kelling, Lucile 25, 81, 162
Kennard, Kathryn 88
Kimbrough, T. R. 24
King, A. K. 42
Knight, Edgar W. 40
Knight, Samuel Bradley 18, 23
Koch, Frederick H. 27, 28, 162
Kuhlman, C. E. 30
Kuykendall, Ruth Wharton 116
Kyker, G. C. 13

La Rochelle, F. T. 22
Le Baron, Philip Mallory 63
Laird, Wilson 60
Lane, Eleanor 48
Lane, George S. 64, 162
Langston, A. D. Beach 46
Lasley, John W., Jr. 82, 83, 86, 87
Latimore, P. H. 22
Lawrence, George H. 119
Leavitt, S. E. 107, 112, 114, 116
Lefler, Hugh T. 66, 73, 74, 75, 77
Linker, R. W. 108, 110
Lloyd, William R. 91
Loftin, J. C. 19
London, Lawrence F. 82
Low, Frank N. 8
Lowman, Professor 151
Lumpkin, B. G. 47
Lyons, J. C. 108, 115

PAGE
MacCarthy, G. R. 61, 62
MacKaye, Eunice 48
MacKinney, Loren C. 66, 75
MacMillan, Dougald 48, 148
McNider, Wm. deB. 90, 162
MacPhee, Halsey M. 104
McCain, John Walker 50
McCaig, Jean 129, 137
McCall, Fred B. 80, 81
McCampbell, J. C. 62
McChesney, E. W. 144
McDearman, Ella Battle 18, 23
McFerrin, John Berry 36
McGinnis, Mamie Rose 119
McKee, W. J. 45
McKnight, William Albert 116
McLeod, W. M. 108
McNeir, W. F. 46
McPherson, Mary Banks 77
Maaske, Roben J. 42, 43, 162
Mack, Edward, Jr. 14, 142
Macormac, A. R. 16
Mackie, Ernest L. 87, 140, 147, 151, 161, 162
Maclachlan, John Miller 126, 136
Magoffin, James E. 15, 16, 23
Malone, Kemp 50
Markham, D. W. 81
Markham, Edwin C. 17, 18, 23, 24
Matthews, M. M. 50
Matthews, Velma 8
Mauck, Elwyn A. 100, 163
Meibohm, E. P. H. 23
Mell, Mildred 122
Melvin, Perry D. 12
Mendenhall, Mildred 104
Meyer, Harold D. 122, 163
Miles, Henry J. 106
Mills, Mary Stuart 57
Milne, David T. 14, 16
Mizell, Myrtle Powell 130
Moore, Bernice Milburn 124, 135, 138, 139
Moore, Charles Albert Petigru 57
Moore, Harry E. 122, 123, 125, 134, 138, 139, 163
Morris, Joseph Edgar 44
Morrison, Roy W. 44, 45
Morton, Louise M. 51
Moses, Walter 50
Moyer, E. F. 109, 117
Mulder, John E. 80
Munch, John 84
Murphy, Winnie Alice 57

PAGE

Nahikian, H. M. 84
Napier, W. B. 108
Newsome, A. R. 66, 70, 74, 77, 78
Nicholes, P. M. 19
Nicholson, Frank 21
Niggli, Josephina 27

Odum, Howard W. 120, 121, 122, 123, 125, 126, 130, 134, 135, 137, 138, 139, 163
Ogg, R. A., Jr. 22
Ohlmann, Gilbert 51
Olive, William J. 53
Owen, W. W. 24

Paine, Gregory L. 46, 56, 57, 164
Park, H. V. 84
Parker, Hermon 98, 99
Parker, John W. 28
Peacock, E. E. 29, 38, 39
Peery, William 28
Pegg, Carl Hamilton 75
Pegram, Mrs. J. Roger 122
Perry, Margaret Kelley 130, 135
Perry, W. A. 16
Pfeiffer, Karl 47
Phillips, Merton Ogden 37
Pierson, W. W. 99
Pittman, Charles L. 47
Plyler, E. K. 96, 98
Poole, R. F. 147
Porges, Ralph 106
Prouty, William F. 60, 63, 64, 151
Preston, Carleton E. 41, 164

Rabun, James W. 77
Rairigh, W. N. 101
Randolph, Mary C. 48
Rhyne, Jennings J. 134, 138
Rhyne, William Lawrence 77
Rice, O. K. 22, 23
Riddick, Edith Imogene 117
Ritchie, Donald D. 10
Robertson, Durant Waite, Jr. 58
Rose, Norma Virginia 58
Rosenau, M. J. 140
Ross, Jane 94
Ruark, Arthur E. 94, 95
Rulfs, D. J. 48
Russell, H. K. 52, 58
Russell, Josiah C. 68, 76, 149
Russell. Mary Margaret 52
Rutenber, Charles B. 12

PAGE
Sadler, Alton Guy 39
Sams, H. W. 48
Sanders, James M. 103
Sanders, S. G. 26
Sanders, W. B. 118, 119
Sanford, Gertrude Skow 122
Scales, Mary Lee 51
Schinhan, Jan Philip 88, 89
Schwenning, G. T. 30, 31, 34
Seawright, Claude 51
Seay, Dorothy 78
Seebeck, C. L., Jr. 84
Selden, Samuel 27, 29, 51, 148
Self, E. B. 89
Shanor, Leland 11
Sharpe, Robert B. 51
Shearin, Paul E. 97
Shelton, Nollie Wilbourne 45
Shockley, M. S. 47
Simkins, Thomas Moorman 26
Simkins, Virginia Beckett 26
Simmons, N. L. 14
Sink, W. G. 19
Sitterson, J. Carlyle 69, 70
Smith, Robert Edward 87
Smith, Sherman E. 24, 140
Sowers, Ray V. 122
Spearman, Walter 28
Staab, Herman 164
Stewart, Anne Blanche 78
Stewart, Laurie 11
Stone, Olive M. 136
Straley, H. W., III 60, 62
Stuhlman, Otto, Jr. 95, 96, 142, 147
Suskin, A. I. 24, 25, 81
Svendsen, James Kester 46
Swalin, Benjamin F. 88
Swedenberg, Hugh Thomas 54

Taylor, G. C. 46, 53, 55, 57, 58
Taylor, J. R. 16
Taylor, Leon Bayard 45
Taylor, Malcolm D. 33, 40
Thomas, George F. 91
Thomason, Bruce 122
Thompson, John Archie 111
Thorpe, James Ernest, Jr. 58
Toops, H. A. 103
Totten, H. R. 9
Trabue, Marion R. 43
Treanor, Sapelo 109
Trimble, Ralph M. 59
Tucker, G. H. 131

Urey, Harold C. 95

PAGE

Van Hecke, M. T. 80, 81
Vance, Rupert B. 123, 135, 136, 164
Vogler, R. D. 83

Wager, Paul W. 118
Wagstaff, Henry McGilbert 77
Wallace, L. DeLong 48
Wallace, R. M. 48
Wanzer, M. F. 162, 163
Ward, Judson C., Jr. 67
Watkins, Joe Henry 64
Watters, Don Albert 29
Way, Evelyn 26
Way, Katharine 98
Weaver, Philip Johnson 78
Weaver, W. R. 110, 112
Wells, Edgar Franklin 93
Wells, William 52
Westbrook, J. A. 106
Wettach, R. H. 80, 81
Wharton, Vernon L. 67
Wheeler, A. S. 13
Wheeler, John A. 97, 98, 99
Wherry, R. J. 102, 103
Whichard, R. D. 109
White, James W. 96
White, R. B. 80
White, William A. 60
Whitney, Vincent Heath 130
Wickens, Delos Donald 104
Wilder, F. S. 33, 136, 139
Wiley, W. L. 109
Williams, Annie John 83
Williams, F. D. 96, 67
Williams, H. H. 93, 94
Williams, Robert Hackney 21
Wilson, H. V. 131, 147
Wilson, W. L. 50, 161
Winslow, R. S. 34
Wittmeyer, Herman 46
Wolf, H. D. 31
Wolfe, John Harold 71
Wood, J. H. 19, 20
Woodard, C. M. 108
Woodhouse, E. J. 101
Woodward, Comer Vann 72
Woodworth, Robert 122
Woosley, John B. 30, 35, 36, 38, 164
Wren, James C. 8
Wright, H. E. 13
Wright, T. E. 109

Yapar, Nihat Ferit 40

Zimmermann, Erich W. 29, 37
Zucker, A. E. 52, 64, 65, 148, 150